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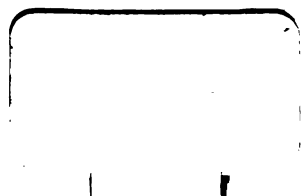
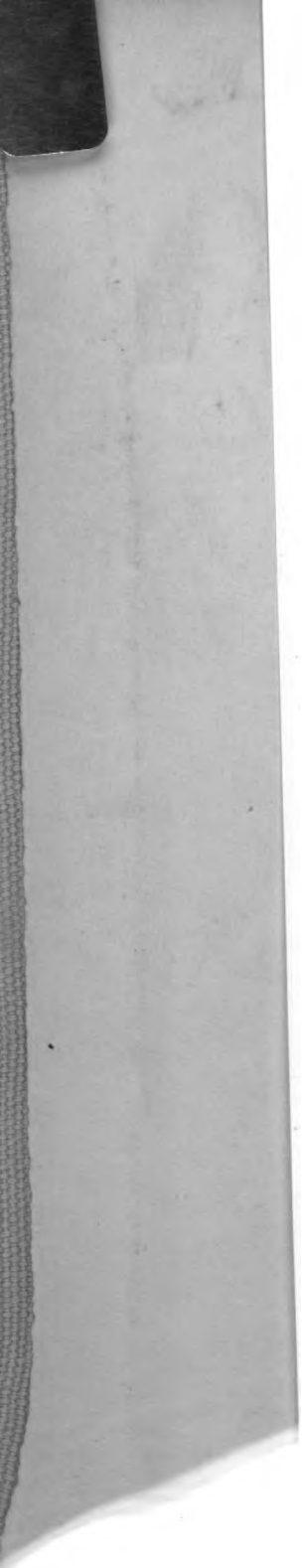
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The American Museum journal

American Museum of Natural History



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THE DUCK HAWK HABITAT GROUP.
Gallery Floor. Hall No. 308.

The American Museum Journal

VOL. IX

JANUARY, 1909

No. 1

THE DUCK HAWK, HACKENSACK MEADOW AND EGRET GROUPS.

THE JOURNAL presents this month photographs of three Bird Habitat Groups. Two of these, recently completed, are of special interest to residents of the vicinity of New York City. The first shows the Duck Hawk or Peregrine Falcon as it nests on the Palisades. This Falcon is famed for its fearlessness and strength of wing and talon. Among falconers the Peregrine was rated second only to the Gyrfalcon and no person of lower rank than an earl was permitted to own and fly one of these noble hawks. The Peregrine is found throughout the greater part of the world but is nowhere common. Near New York City it is known to nest only on the less accessible ledges and cliffs of the Palisades and Hudson Highlands.

The second local group illustrates the bird-life of our Hackensack Meadows in August. During this month, and in September, these marshes are the home of myriads of birds which come to them to roost and to feed. Swallows of several species are comparatively rare in the marshes during the day, but late in the afternoon they stream in by the thousand, coming from every direction and steering their flight toward some regularly frequented roost in the reeds. They leave early in the morning radiating to all points of the compass to scour the country for food. Red-winged Blackbirds, Bobolinks, now called Reedbirds, and Carolina or Sora Rail are attracted to the marshes by the wild rice which ripens about this time; and the last two are now killed in large numbers. In August the marshes are remarkable not only for their birds but also for their flowers. Marsh mallows, cardinal flowers, jewel-weed, sagittaria, pickerel weed, loose-strife, wild sunflower, hempweed, vervain, gerardia and many other species bloom so luxuriantly that one might imagine that nature was holding a flower show.

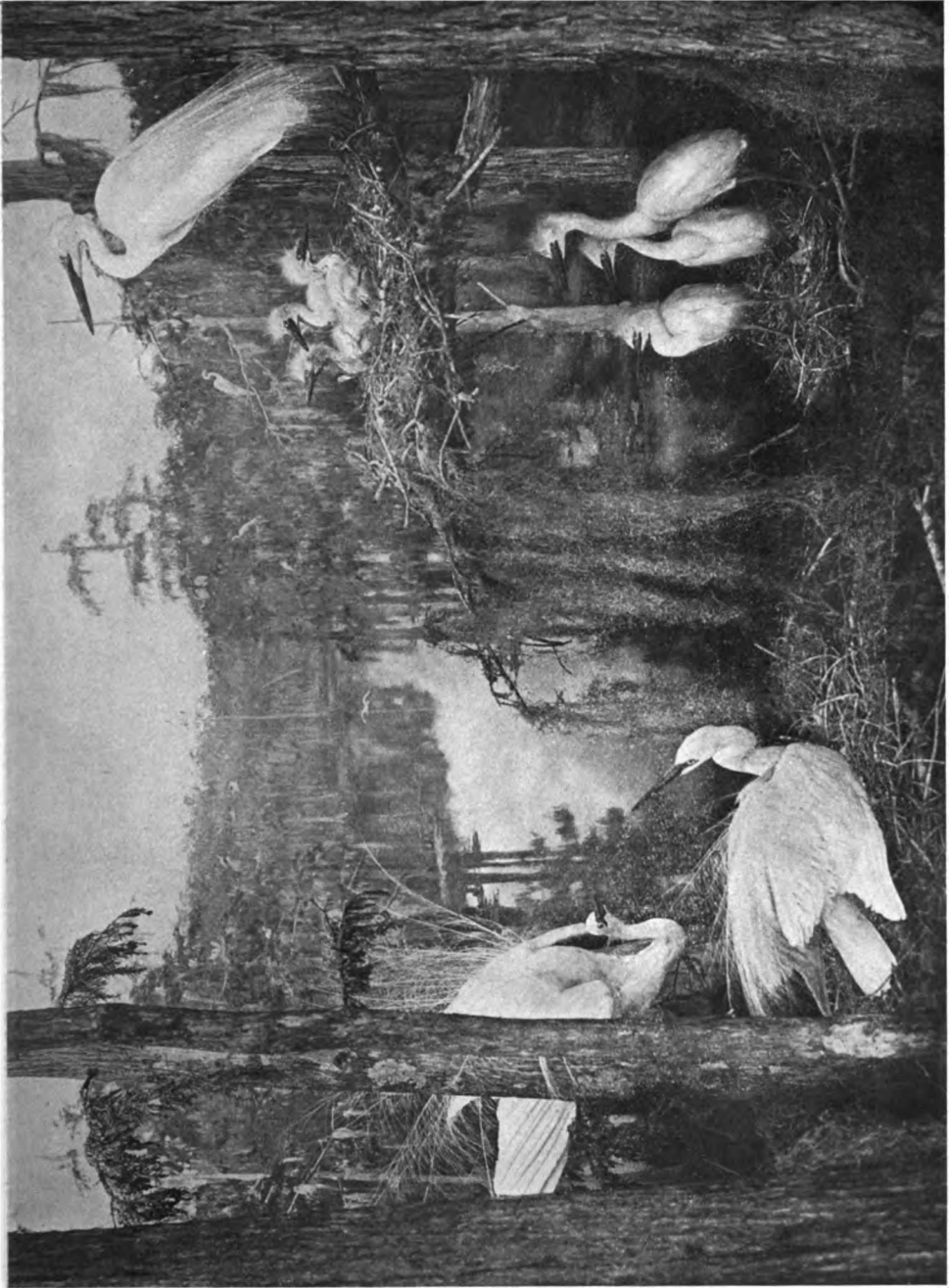
The third group shows part of a colony of the White Egret in a flooded cypress forest of South Carolina. This Habitat Group was added to the series early in the year, in fact the history of the accumu-

lation of Egret studies is reported in the *JOURNAL* for December, 1907. Both the birds and their haunt are singularly picturesque. The nests are high in the trees and look out over the waters of a swamp through ragged cypress sprays and festoons of "Spanish moss." This is the Egret that has been brought so near extermination by the plume-hunters. It is a matter for rejoicing that there still exists this large South Carolina rookery and, moreover, that it is within the precincts of a game preserve where continued protection is assured.

TWO NOTEWORTHY FOREIGN MUSEUMS.

TWO European museums of natural history, rather small and relatively recent in establishment, are nevertheless peculiarly noteworthy. This is according to the impressions of Mr. James L. Clark, of the Department of Preparation and Installation, who spent the summer of 1908 abroad. The institutions in question are the Musée de Tervueren, or Congo Museum, just outside of Brussels, and the Senckenberg Museum at Frankfurt; and their prominence is the result of methods of installation, displaying objects in direct relation to their environment or to industry.

The Musée de Tervueren is an unpretentious one-story building with its two main halls devoted to the zoölogy and ethnology, respectively, of the Congo Free State. The hall of zoölogy contains many rare mammals, birds and fishes, several okapi of different ages making perhaps the most striking exhibit. It is the hall of ethnology, however, that claims emphatic admiration in Mr. Clark's opinion. The lighting is from above. Each specimen is well placed and is accompanied by photographs illustrating action or use. The general arrangement is in alcoves, where are shown various phases of every day life. In the alcoves devoted to home life, for instance, straw mats and implements and utensils of the hut are arranged on the walls as a background; large pieces, such as stone pestles, or models of the huts, are set on the floor; while a life-sized family group is made to occupy the central space. The figures of these groups are beautifully modeled and executed in plaster, cleverly painted, and are clothed in the genuine wearing apparel of the natives. The people are represented in action, grinding grain or



THE EGRET HABITAT GROUP.
Gallery Floor. Hall No. 308.



THE HACKENSACK MEADOW HABITAT GROUP.
Gallery Floor. Hall No. 308.

making ornaments, as the case may be. Finally, above the alcove exhibit, mural paintings of an entire settlement show the village life. Thus is told in a comparatively small space a complete story of Congo home life in a manner highly instructive and artistic as well.

The Senckenberg Museum at Frankfurt is in connection with the University. The building is modern, well lighted and provided with a large hall equipped for lectures and study. A group of African antelope with a painted background to show environment proclaims the enterprise of the institution and the tendency of its work. The large *Dipodocus* presented by the late Mr. Morris K. Jesup, while president of the American Museum of Natural History, stands in the main foyer.

The world to-day demands not only that the modern museum shall exhibit a multitude of rare and splendid specimens for the use of scientists and students, but also that it shall so install these specimens that they will make a vivid appeal to the ordinary observer, forcefully portraying stages in the evolution of the material world and in the history of civilization.

THE INTERNATIONAL TUBERCULOSIS EXHIBITION.

UNDER the auspices of the Charity Organization Society of the City of New York, the International Tuberculosis Exhibition opened November 30th in the new northwest wing of the Museum. It immediately proved its power to attract. By the close of the fourth day it had been visited by 65,000 people, and before the end of the first week by one-third of the half-million attendance expected by the society for the whole period of six weeks.

So admirably is the exhibition organized that it readily permits comparative study. The extensive German display, prepared under the auspices of the Imperial Board of Health of Berlin, stands mainly for treatment and cure, as do also the exhibits of Switzerland, Hungary and several other foreign nations, while Ireland's notable campaign under the Women's National Health Association has been aimed toward an education that would bring about prevention.

The keynote of the American exhibits also is prevention. Those of Pennsylvania and Rhode Island are realistic in the presentation of actual

living rooms to contrast the conditions promoting tuberculosis and the conditions that should obtain. A part of New York's exhibit shows the disastrous effects of over-crowding under adverse light and air conditions, comparing models of old tenements and those built under the new law and bringing to mind the striking features of the "Congestion of New York" exhibition held here last winter and the Tuberculosis exhibition of three years ago. Massachusetts gives a study of the industrial aspect of the disease, showing photomicrographs of dust and dust-clogged lungs, and making plain the need of efficient protection for workers in horn and celluloid, steel, iron, felt and other materials.

A prominent place at the south entrance is occupied by the exhibit of the New York Charity Organization Society's Committee on the Prevention of Tuberculosis. This Committee at the recent International Congress in Washington shared with Ireland the first prize of \$1,000 for the best evidence of effective work. Just to glance through this Committee's mass of free literature put forth in Yiddish, Italian, Bohemian, Swedish, French, German and English is to gain a realization of the comprehensive character of its work.

New York City has been fortunate in a coöperation of officials and physicians, and, in the opinion of Dr. Robert Koch, has a better organization for the prevention of tuberculosis than any other city in the world. In 1886, the death rate from tubercular diseases was 4.42 per 1,000; in 1907, it was 2.42 per 1,000, a decrease of more than 40 per cent. Of the 14,000 free beds for tuberculosis patients in the United States, 25 per cent are in New York City. But, as was emphasized at the meeting that formally opened the exhibition, conditions in New York can never become ideal, and tuberculosis as rare as smallpox, until there is a trio of forces at work — officials, physicians and an enlightened public. Hence the value of the Tuberculosis Exhibit as an educative force in counter-acting habit, ignorance and prejudice; hence the place of the exhibition within the walls of the American Museum of Natural History and its classification with other evidences of increased knowledge and municipal progress, such as playgrounds and free baths, parks, schools, museums and free public lectures.

A review of the whole exhibit, or of even a part of the whole, convinces one that tuberculosis is a preventable disease, that the 1,095,000 lives sacrificed to it each year (200,000 in the United States, 14,406 in New York State in 1907) are an unnecessary loss. It is the human interest

in this stupendous fact that holds the visiting throngs of whatever station in life to earnest study of alcove after alcove. The exhibition also makes it clear that, in most parts of the world at least, the fight against tuberculosis is well on. At the same time, it suggests even more definitely that the prevention of tuberculosis must be a prevention of infection, and that therefore the manner of the warfare must be segregation.

It is interesting in this connection to compare tuberculosis and leprosy. Both are caused by bacilli whose growth produces local tissue changes; both may have a long period of latency; both are protracted in course; both lack evidence of hereditary predisposition. Out of all expert discussions, this fact remains the final issue: that a complete stamping out of the white plague can never take place, no matter how resistant to tubercle bacilli the populace can be made, except by segregation of advanced cases. This conclusion is reached not only by analogy with diseases like leprosy, nor only by a study of the pathology of the disease, nor only by experimentation with cattle by which extermination of tuberculosis was effected in numerous herds in one generation by segregation, but also by a comparison of the actual experience of various countries. This comparison shows institutional care rather than any condition of living or industry, the influence that remains in constant relation to the amount of tuberculosis existing; therefore this institutional care must be the predominant influence. A knowledge of this adds new force to a prominent feature of the exhibit,—models of hospitals and sanatoria, such as those designed for the new buildings to be put up at the Henry Phipps Institute, Philadelphia. The visitor searches for facts, not merely of structure, but likewise of organization and maintenance of such institutions. How many will be privately endowed? How many should be erected and supported at the expense of state or nation? These are questions that must have practical answers in the near future. It is computed that if every consumptive now dying in the state of New York were given hospital care, the number would be about one-half of the insane supported at public expense.

Man's infection from bovine tuberculosis is given emphasis in various exhibits, particularly in the pathological work presented by the Bureau of Animal Industry of the United States Department of Agriculture, in the laws of the New York Department of Health with regard to the city's milk supply, in a demonstration of the pasteurization of milk, and in the equipment of a model dairy and model cowshed shown in

temporary structures just outside the north entrance to the exhibition. It must be conceded, however, that among physicians there exists a difference of opinion, relatively unimportant in its practical bearings, concerning the matter of man's infection from cow's milk. Many believe that milk is a minor vehicle of infection for adults, though a potent one in the case of children. In fact, the controversy that arose at the Congress of 1901 as to the identity of human and bovine tubercle bacilli is still an unsettled scientific question, with Dr. Koch maintaining the distinct character of the two germs but allowing the possibility of man's infection from bovine bacilli.

The International Tuberculosis Exhibition must be admitted to be of far-reaching significance. It stands for increased knowledge of nature, of the relations between the hosts of the microscopic world and the health of man; it stands for social and economic progress; and, happily, it means for the future a closer union between men of science and men of affairs. Besides accomplishing its main object, it is certain to bring about, in general, more hygienic ways of living, broader ideas of the work that should be done in health-control by city, state and national governments, and a more practical recognition of the obligations of mutual helpfulness.

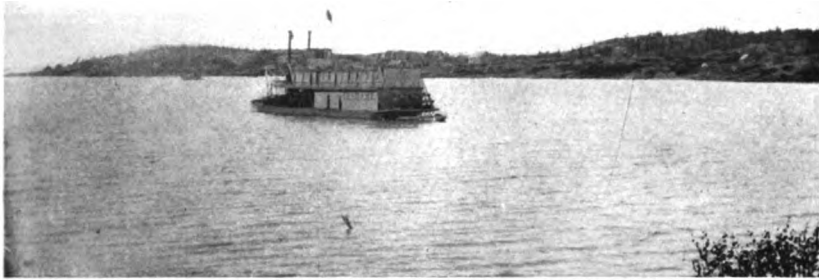
The exhibition will be open to the public until January 10. Numerous mass meetings and special conferences are being held by physicians, medical students, nurses, social workers, labor unions, street railway employees and others, with announcements in the daily papers of the dates of these meetings and the programmes of speakers.

AN ETHNOLOGICAL TRIP TO LAKE ATHABASCA.

DURING the summer of 1908, by arrangement between the Museum and the New York Academy of Sciences, I undertook an ethnological expedition to the Chipewyan Indians of Lake Athabasca. Leaving New York on the 5th of May, five days' travel brought me to Edmonton, probably the greatest fur-mart of the world and the northernmost point that can be reached by rail. It was at this place, in the office of the Hudson's Bay Company, that I completed my camping outfit and procured the two articles considered the most essen-

tial parts of a Northland traveler's equipment, a mosquito bar for protection at night and a netting for day use. After leaving Edmonton two days' stage journey found me at Athabasca Landing, the last post office and the head of the Arctic inland water-route.¹

Here, I joined Captain Kelly of the Hudson's Bay Company, who was prepared to start down stream with a fleet of seven scows bearing the yearly provisions for all the Company's northern trading posts. Each boat was manned by several oarsmen, who rowed after the fashion of the old Roman galley-slaves, rising from their seats at each stroke, and by a steersman who manipulated a heavy sweep. For several days



THE "GRAHAME" ON LAKE ATHABASCA.

we alternately rowed and drifted down the Athabasca River, our half-breed crew whiling away leisure time with a hand-game similar to our "button, button, who's got the button."

By the 19th of May we were only a short distance above the Grand Rapids of the Athabasca, and, owing to the extreme shallowness of the water and the numerous rocks in the river-bed, the oarsmen were obliged to punt instead of row. At the Grand Rapids, the river is divided into two channels by an island nearly a half mile long. The

¹ Dr. Lowie's route may be traced by studying the map on page 102 of the *JOURNAL* for November, 1908.

western of the two channels is wholly impassable, but the eastern channel can be traversed, provided boats have been lightened of their cargoes. Accordingly we removed our freight and baggage to the shore, transporting them the length of the island in hand-pushed carts or on our backs, and steered the emptied scows through the shoals along the eastern bank. Finally, at the far end of the island, we reloaded the boats, having consumed six days in the tedious operation.

The next hundred miles gave an almost continuous succession of rapids, which, however, our scows passed without damage. We reached



HEADMAN



"OLD CATHARINE."

Fullblooded Chipewyan.

Ft. McMurray, the objective point of the scows, on the 28th of May. Here the freight was unloaded and piled on the bank to await the arrival of the Hudson's Bay Company's steamer, the "Grahame," which plies irregularly between Ft. McMurray and Smith's Landing. Captain Kelly then turned back, leaving me and two half-breed watchmen with three days' supply of provisions — which it turned out we had to husband with care, since the steamer did not appear for eight days. The remainder of the trip presented no unusual features, and on the 8th of

June, I landed at Ft. Chipewyan, on the northwestern shore of Lake Athabasca. Here I found good opportunity for the investigation I had planned, since this settlement is one of the chief rendezvous of the Chipewyan Indians.

These Indians are a branch of the Athabaskan, or D  n   stock, the largest linguistic family of North America, embracing the Hupa of California and the Apache and Navajo of the Southwest, as well as the aborigines of the Mackenzie River basin. They do not live on reservations, but hunt and fish in primitive fashion around the shores of Lake Athabasca, Lake Claire and the Slave River. Peltries are offered to the Hudson's Bay Company and to rival "free-traders" in exchange for clothing and provisions; but, even with these supplies, considerable hardship is often encountered during the long winters.



TALLEST CHIPEWYAN MEASURED.
Height 6 feet 2 inches.



CHIPEWYAN BOYS.

Many valuable photographs were secured at Ft. Chipewyan and at Fond du Lac near the eastern extremity of the Lake. The physique of the Chipewyan differs considerably from the Sioux prototype on which popular conceptions of Indian appearance are modeled. Their cheekbones are, on the whole, less prominent; and, as the hair of the face is not plucked out, fairly heavy moustaches are common and whiskers also occur. Though not averaging below five feet seven inches in height, the natives of the Athabasca district are short as compared with the Plains Indians.

Ethnologically, the Chipewyan were found to share two fundamental traits of all their Athabaskan congeners: (1) great simplicity of organization and (2) extraordinary susceptibility to extraneous influences. They do not practise any elaborate ceremonials, nor is there any strongly centralized executive power; esoteric fraternities and age-societies are lacking. Shamanistic activity, however, flourished until recent times, and within the memory of men still living at the fort, there resided at Fond du Lac a medicine-man, who, according to the belief of the natives, could transform himself into a wolf and thus hunt the moose. In their mythology, the Chipewyan betray a strong family resemblance to their northern congeners. There are tales of giants, of the man in the moon, of a weird foundling who by his magical powers aided his people in times of famine, and of a powerful shaman who avenged his father's murder and destroyed all his enemies until the time when he himself perished by an accident. The receptivity of the Chipewyan is shown by the strong influence exerted by the Catholic missions and the Hudson's Bay Company, both of which have profoundly modified primitive conditions. Other instances in point are the adoption of a complete Cree cycle into their mythology, and the imitation of their southern neighbors in the Cree tea-dance, a purely social diversion.

In July, an opportunity offered to return to civilization with a free-trader. Our little craft was towed for three days by a small tug through 172 miles of lake and river to Ft. McMurray. There the eight men of the crew were harnessed to a tow-line to pull the boat up the remaining 265 miles of the Athabasca River. At each of the rapids, we were obliged to get out and commence an "obstacle-walk," at times for several miles, now clambering up a five-foot ledge of limestone, now trying to get a foot-hold on a slippery earth-bank, dodging lodged deadfalls, and jumping across logs in our way. Every night we camped

ashore, pitching our mosquito-bars on wet soil or dry as the case might be. At five o'clock each morning we rose, bundled up our bars and bedding, re-embarked, and continued our journey. 'Twenty miles' journey we considered a good day's work. As we were not fortunate enough to sight any moose, our diet was a well-nigh uninterrupted combination of bacon, bannocks and beans. We made the trip, as a whole, in relatively short time, covering the total distance of 437 miles in seventeen days, but it was with a sense of great relief that we ultimately sighted the wharves and buildings of Athabasca Landing. From there we took the stage to Edmonton, and were again in railroad connection with the outside world.

R. H. LOWIE.

MUSEUM NEWS NOTES.

THE HON. MASON MITCHELL, to whom the departments of Anthropology and Mammalogy are already indebted for much valuable material from eastern Asia, presented to the Museum in December an exceptional series of ethnological specimens from Tibet, together with some choice things from China and India. An extended notice of this acquisition is reserved for a future number of the JOURNAL.

THE Department of Anthropology has recently received a guanaco skin cape as a gift from Mr. Charles H. Townsend, who obtained it some years ago at Punta Arena, Strait of Magellan. The guanaco is a mammal related to and somewhat larger than the llama. The hair of the adult is coarse, so that old skins are not suitable for use in the manufacture of garments, but the hair of the young is fine, and animals probably not more than two weeks old are slaughtered for skins to be used in capes like the one just received. The skins are sewed together with ostrich sinew. The Tehuelches of the continental side of the Strait wear the robe with the hair next to the body, while the Onas across the water from them, where the rainfall is much greater, turn the fleece side out, since the hair readily sheds water.

THE following members have been elected since the last issue of the JOURNAL: Life Members, MESSRS. GEORGE SHIRAS, 3D, JAMES W.

ELLSWORTH, HENRY A. MURRAY and GORDON KNOX BELL and MMES. EMMA B. AUCHINCLOSS, EMILY H. MOIR and WILLIAM CHURCH OSBORN; Annual Members, MESSRS. WALTER E. FREW, GEORGE F. NORTON, CHARLES SCRIBNER, PARKER D. HANDY, EDMUND D. RANDOLPH, JEFFERSON CLARK, GEORGE L. JEWETT, MARCUS MAYER, JACQUES BALLIN, WM. R. BEAL, CHARLES E. HERRMANN, ANTONIO KNAUTH, CHARLES W. MCKELVEY, JOSEPH NATHAN, ROBERT SCOVILLE, E. A. S. CLARKE, KARL BITTER, ROSWELL MILLER, WM. GORDON FELLOWS, FRANKLIN MURPHY, A. J. SAUTER, JOS. H. STEINHARDT, CARL DREIER, ALPHONSE MONTANT, RALPH PULITZER, G. H. RISLEY, WM. FELLOWES MORGAN, DE LANCEY NICOLL, NATHAN STRAUS, MOSES BIJUR, RUDOLPH E. SCHIRMER, GEORGE W. JENKINS, ROBERT M. GALLAWAY, J. G. TAYLOR, HEINRICH SCHNIEWIND, JR., HENRY B. BARNES, W. J. CURTIS, EBEN RICHARDS, WM. ARMISTEAD LANE, S. L. SCHOONMAKER, ISAAC J. BERNHEIM, T. A. HAVEMEYER, JOHN ZIMMERMANN, SAMUEL MOFFITT and C. A. TATUM, REV. W. R. HUNTINGTON, COL. JOHN SCHUYLER CROSBY, DOCTORS ALFRED K. HILLS, CHARLES MCBURNEY, ELMER A. SHEETS, DANIEL M. STIMSON, BERT. A. BURNS and LYMAN ABBOTT, MMES. JOHN WELLS, JOHN HOBART WARREN, E. H. HARRIMAN, R. SOMERS HAYES, T. B. WOOLSEY, MARY A. TUTTLE, ISAAC N. SOLIS, J. E. SPINGARN, R. DUN DOUGLASS, G. G. WHEELOCK and FLORENCE P. MAXWELL and Dr. ANNA BLOOMER.

LECTURE ANNOUNCEMENTS.

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required.

Lectures begin at 3:15 P. M. Doors open at 2:45 P. M.

Two lectures remain to be given in this course:

New Year's Day, January 1, 1909.

"Florida Bird Life." (Moving pictures.) By FRANK M. CHAPMAN.

Washington's Birthday, February 22, 1909.

"Some of the Food and Game Fishes of the Eastern United States.—
Habits and Methods of Capture." By ROY W. MINER.

COLUMBIA UNIVERSITY COURSE.

JESUP LECTURES.

GIVEN in coöperation with Columbia University.

Wednesday evenings at 8:15 o'clock.

Continuation of a course of lectures on light by PROFESSOR RICHARD C. MACLAURIN of Columbia University.

- January 5.— "The exact laws of reflection and refraction and their bearing on the construction of optical instruments."
 January 13.— "Optical properties of crystals."
 January 20.— "The principle of interference and its explanation of various color phenomena."
 January 27.— "The measurement of light waves and the theory of diffraction."
 February 3.— "Some relations between light and electricity."

PEOPLE'S COURSE.

GIVEN in coöperation with the City Department of Education.

Tuesday evenings at 8 o'clock. Doors open at 7:30.

IAN C. HANNAH,— a course of six lectures on European relations with the Far East.

- January 5.— "The East and the West and Their Different Ideals."
 January 12.— "China's Everlasting Empire."
 January 19.— "England's Eastern Empire."
 January 26.— "The Russian March Across Asia."
 February 2.— "Japan's Transformation."
 February 9.— "America as an Asiatic Power."

Saturday evenings at 8 o'clock. Doors open at 7:30.

- January 9.— PROFESSOR LAFAYETTE B. MENDEL of Yale University, "Development of the Milk Industry."
 January 16.— HON. J. S. WHIPPLE, "The Adirondack Forest."
 January 23.— PROFESSOR LAFAYETTE B. MENDEL, "Growth and Beauty of Children."
 January 30.— WILLIAM L. HALL, "Forests and Waters."

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy.

Second Mondays, Section of Biology.

Third Mondays, Section of Astronomy, Physics and Chemistry.

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York, The New York Entomological Society and the Torrey Botanical Club.

On Wednesday evenings, as announced:

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.

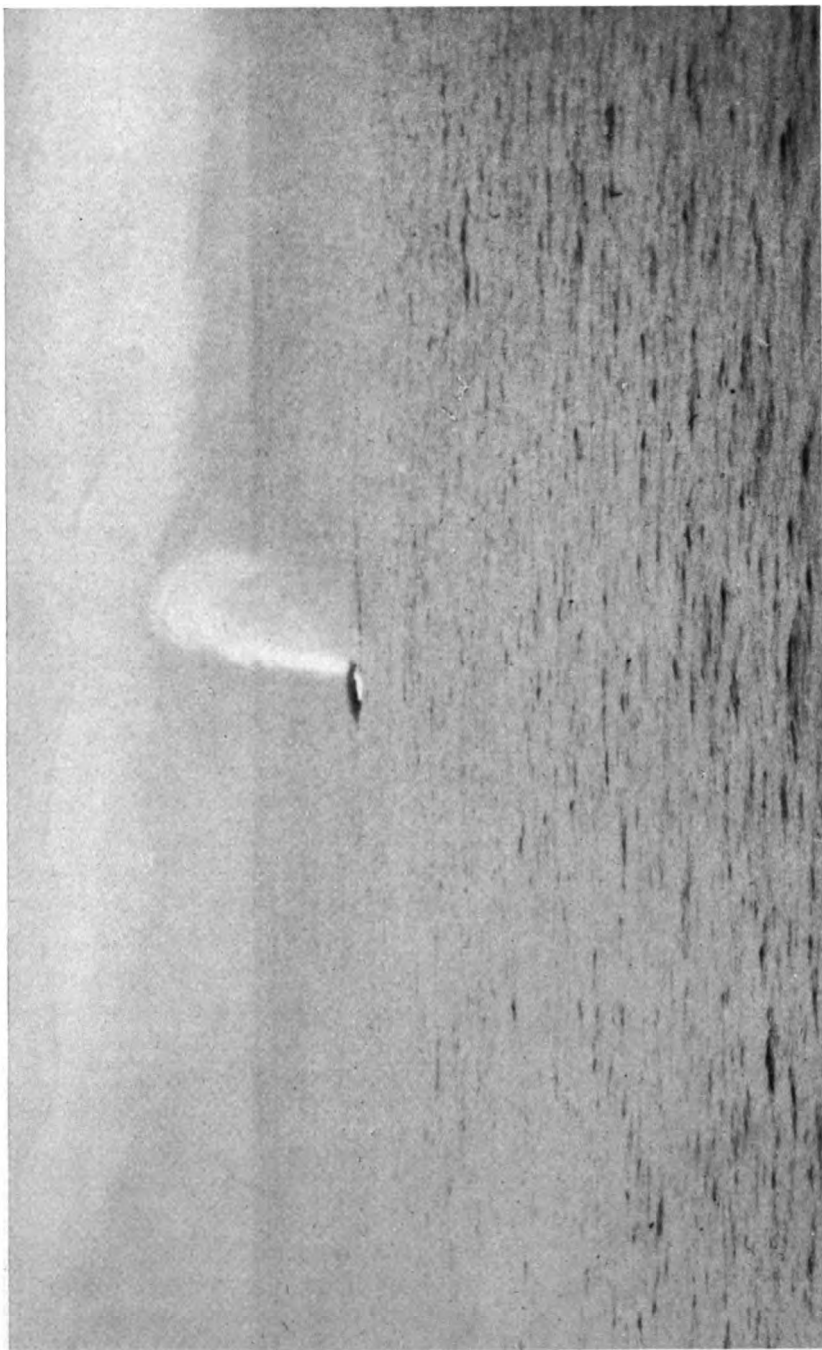
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Act of Congress, July 16, 1894.



THE "SPOUT" OF A FINBACK WHALE. AUGUST 20, 1908.
Photographed from a distance of about one hundred yards.

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No. 2

A SUMMER WITH THE PACIFIC COAST WHALERS.

THE recent establishment of several shore-whaling stations on the coasts of Vancouver Island and Alaska, has made possible a study of certain species of the large whales inhabiting the North Pacific Ocean. With the exception of a single work, "Marine Mammalia," written by Captain C. M. Scammon in 1874, these animals have remained almost unknown scientifically, and their relationship to the corresponding Atlantic forms, which have been carefully investigated by Dr. F. W. True, has never been satisfactorily determined. To secure data for a comparative study of the external and osteological characters of these whales, I left New York late in April on a Museum expedition to the west coast whaling stations.

The species commonly taken there are the Humpback, Sulphur-bottom and Finback, the first-named in largest numbers. All belong to the group known as Finwhales, having short, coarse baleen or "whalebone" and thin blubber. Before the invention of the harpoon gun in 1864, they were seldom hunted, because the comparatively small yield of oil and whalebone and the great speed of the animals in the water, together with their tendency to sink when killed, rendered them *persona non grata* to the men in the small boat. To-day, however, they are being taken at a rate which threatens their speedy extinction.

The study of whales is beset with many and unusual difficulties. Their great size, alone, is a serious obstacle. If one wishes to do such an ordinary thing as to turn over a fin for observation of the color or markings of the other side, he must have the assistance of not only one man but several. Thus the naturalist is totally dependent for the success of his studies upon the men about him, in fact, they make or ruin his work by their attitude toward it.

Fortunately, I met with most courteous treatment from the owners of the stations, and my thanks are due to the Pacific Whaling Company and Dr. Rismuller of Victoria, B. C., and to Captain I. N. Hibbard of

the Tyee Company, Alaska; also to the managers of the several factories, Messrs. J. Quinton, S. C. Ruck and V. H. Street. These gentlemen, by their generous coöperation in extending the courtesies of their stations and vessels, rendered my stay pleasant as well as profitable.

The months of May and June were spent on the west coast of Vancouver Island, at Sechart, an old Indian village site on Barclay Sound. Although the weather was bad, Humpback whales were plentiful, and whenever a fair day broke the monotony of rain and fog, the following morning we were sure to find four or five Humpbacks floating breast-up at the end of the wharf. On such a day there was need for rapid work. Little could be done until the whales were drawn out of the water upon the "slip," as the long inclined platform is called; then photographs, detailed measurements and descriptions had to be secured before the animal was denuded of its blubber covering. The ease and quickness with which a large whale weighing, perhaps sixty or seventy tons, can be handled by means of the steam winch is almost incredible; within fifteen or twenty minutes from the time the animal is taken from the water, little remains of the blubber on the upper side. In order to determine the extent of individual variation in color and external characters, each specimen was carefully described, a "standard" set of measurements taken, and as much additional matter recorded as time and circumstances permitted. While the flesh was being stripped from the bones, there was opportunity for study of the fresh skeleton, and it was possible to obtain many facts relating to variations in the vertebral column, pectoral limb, ribs and other parts. Later many of the bones were measured and photographed. Thirty Humpbacks in all were examined at Sechart, and the skeleton of an exceptionally fine specimen, including its complete set of baleen, was secured.

At the end of June, I proceeded one hundred miles up the coast to the station located in Kyuquot Sound, where Humpbacks, Sulphurbottoms and an occasional Finback were being taken. The weather conditons of the month of July were good, and the facilities for study enjoyed through the kindness of Mr. S. C. Ruck, manager of the station, were exceptional. As the result of one day's hunting, the steamer towed to the wharf two large Sulphurbottoms, one Finback and three Humpbacks, a record catch which raised the total number to twenty-six whales for the week.

At Kyuquot an opportunity offered for work upon a large Sperm



A HUMPBACK WHALE EMERGING FROM BENEATH THE STEAMER.
The blowholes or nostrils are open, since the animal is drawing in its breath.



THE TAIL OF A DIVING HUMPBACK.



THE WHALE HARPOON GUN, READY TO FIRE.



THE GUN HARPOON IN THE AIR.

Showing, besides harpoon and rope, the smoke and sparks of the discharge, bits of burning wadding and the back of the whale.



AN EIGHTY-FOOT SULPHURBOTTOM WHALE ON THE SLIP.
The animal is being drawn out of the water by means of a cable attached to its tail.



BREAST VIEW OF A LARGE SULPHURBOTTOM WHALE.

whale. Sperms are but rarely taken at these shore stations, and I was delighted at the unexpected good fortune. The whale was drawn upon the slip early in the morning, and ample time was given to secure a complete set of photographs and measurements, with a full description of the animal as a basis for a life-sized model to be prepared at the Museum.

The Sperm whale is a strange-looking creature, the great square-ended head having a size out of all proportion to the body and giving the animal a peculiarly shapeless appearance. The whole upper third of the head is devoted to an "oil-tank" containing the valuable spermaceti, which lies in a liquid state and may be dipped out after an opening has been made. Fifteen barrels of pure spermaceti were obtained from the oil-tank in the head of this individual, and twenty-five barrels more were secured from the fat surrounding the head. The total amount of oil, including the spermaceti and that obtained from the meat, bone and blubber, was ninety barrels.

Finbacks were taken at such infrequent intervals at Vancouver Island, that I decided to go to the station at Tyee, Admiralty Island, Alaska, where this species was said to be plentiful. Arriving there early in August, I found that the reports had not been exaggerated, for Finbacks were being brought in every day. I remained at Tyee about three weeks collecting a considerable amount of valuable data, and receiving the most hospitable treatment.

At each of the stations, some time was spent on board the whaling vessels, studying and photographing the animals in the water. Few students of the Cetacea have made attempts to record their observations with the camera. The discomforts of such work are many, and one must be constantly on the alert. Nevertheless, the study is most interesting, for the momentary glimpses of phases of whale-life obtained while the animals are above the water give fascinating hints of what may take place below the surface.

The whaling steamers which hunt from the shore stations are small steel vessels, having a maximum speed of ten or twelve knots per hour. Mounted on the bow; they carry a heavy cannon which shoots a harpoon having an explosive head or point called the "bomb." When the man stationed in the "barrel" at the masthead sights a whale, the vessel is sent at full speed in pursuit, and stopped on the smooth patch of water called the "slick" which invariably follows the whale's dive. Then begins a period of waiting until the animal re-appears. If the place has

been well judged, the whale may come to the surface almost under the vessel's bow. As the animal bursts into view, sending the spout high into the air, the captain swings the gun about, sights along the barrel and fires just as the dorsal fin appears above the water. At times the whale may rise actually under the boat. This happened on one of my trips, allowing me to secure a picture of considerable interest, showing the nostrils or blowholes widely distended during the act of inspiration.

When the whales were too far away for good photographs, I watched their movements with field glasses from the bridge or the "barrel" at the mast-head. From the latter position on several occasions, I saw the act of feeding. The animals eat a small crustacean (a shrimp) about three quarters of an inch in length, which at times floats at the surface of the ocean. When the whale has taken in a mouthful of water containing quantities of these minute animals, it turns on its side, letting the immense under jaw close over the upper, while the water spurts out in streams between the plates of whalebone. The fin and one lobe of the flukes are thrust into the air and even the full length of the body is sometimes exposed, as the animal rolls from side to side.

I was fortunate in securing a photograph of a large Finback whale while it was feeding, and of a Humpback which threw itself entirely out of the water. Other pictures show both species in the acts of spouting and diving. Thus many interesting observations on the habits and "home life" of these strange animals were given indisputable record by the aid of the camera.

ROY C. ANDREWS.

A PORTION of the central Hall (No. 204) of the second floor of the Museum has been fitted up expressly for children, through the generosity of subscribers to a special fund. Among the features of the Children's Room are live animals in aquaria and growing plants, as well as books, pictures and specimens which may be handled by the juvenile visitors. The room is under the direct care of Mrs. Agnes L. Roessler.

THE attendance at the Museum during 1908 was 1,043,562, the record attendance for one day being 63,256, on December 27, 1908. The International Tuberculosis Exhibition was visited by 753,954 persons from November 30, 1908, to January 17, 1909.



ST. PIERRE, MARTINIQUE. VIEW NORTHWARD FROM HOTEL WINDOW.
Rue Victor Hugo, the main street of the city, which has been cleared of volcanic ash and other débris. In the background is Mt. Pelé. May, 1908.



ST. PIERRE, MARTINIQUE. SOUTHERN PART OF THE CITY.
View looking northward from the road to Le Carbet showing growth of vegetation over the city. Mt. Pelé in the background. May, 1908.

ST. PIERRE AND MT. PELÉ IN 1908.

READERS of the AMERICAN MUSEUM JOURNAL will remember that the Museum sent an expedition to Martinique and St. Vincent in 1902, directly after the beginning of the series of eruptions that made that year famous in the annals of vulcanology. The following year the Museum sent a second expedition to observe the changes that had taken place in the two volcanoes, particularly those at Mt. Pelé, Martinique, through the extrusion of the great "spine" that surmounted its eruption cone for nearly a year. Five years passed; the spine fell to pieces, entirely altering the form of the summit cone of Mt. Pelé; eruptions of débris entirely ceased in July, 1905, at Pelé, while there had been none at the Soufrière of St. Vincent after March, 1903; vegetation was asserting its sway over the devastated areas, and human occupation was advancing again toward the craters; hence it was determined to send a third expedition to the region to bring observations on the volcanoes up to date.

Leaving New York April 16, 1908, on the steamship "Guiana" of the Quebec Line, this time accompanied by my wife, I reached Fort de France, the capital of Martinique, Sunday, ten days later. Two days after this we took the ancient little coasting steamer "Diamant" for Le Carbet, an important town on the leeward coast about two miles south of the ruined city of St. Pierre. Le Carbet occupies the site of the most important settlement of the aboriginal Carib inhabitants of the island, and a shrine and cross within its borders mark the spot where Christopher Columbus is supposed to have first set foot upon Martinique in June, 1502.

From Le Carbet, we made the remainder of the journey by canoe, arriving at St. Pierre by ten o'clock with our various belongings and settling at the little "hotel" which has been built on the Rue Victor Hugo, the main street of old St. Pierre. This "hotel" boasts two guest rooms and a dining room of diminutive size, and harbors a store where malodorous salt cod fish and other viands are sold to passers-by; nevertheless, one can stay several days very comfortably at the little hostelry, and it makes convenient headquarters for excursions.

The ruins of St. Pierre look like those of a place destroyed a century ago, rather than only a few years since. Many walls that were standing on the occasion of my second visit, in the spring of 1903, have fallen,

and many streets and buildings that were plainly distinguishable then are now completely obliterated as to surface indications. Earth has been washed down abundantly from the denuded surrounding bluffs and hill slopes, bringing grass and other seeds with it, and the whole city, except for a few clearings, is covered with vegetation. The knotty bunch grass characteristic of the Lesser Antilles is flourishing luxuriantly, together with the castor-oil plant (*Ricinus communis*) and many bushes strange to northern eyes. Here and there a mango or other tree that lived through the terrible eruption blasts and the consequent burning of the city is struggling to recover from its injuries and gives a little grateful shade to the stray wanderer amid the ruins and to the cattle that are being pastured where once stood the cathedral, the hospital, the theatre, the government buildings and the stores and residences of a wealthy city.

The Rue Victor Hugo has been cleared of ash and débris for its entire length from south to north; so too have been the streets connecting this old artery of travel with the road to Morne d'Orange and the south-east, with that to Fond St. Denis and thence to Fort de France and with the route to Morne Rouge and the rich sugar and other estates of the northeastern parts of the island. The clearing of these streets was made necessary to meet the requirements of the great agricultural district that was naturally tributary to St. Pierre and that now must ship out its sugar, rum and other produce by the old route. To accommodate this traffic and the travel between the region and Fort de France, a pier has been built at Place Bertin near the hotel, and regular semi-weekly steamboat service with Fort de France began in June. The Rue de l'Hôpital also has been cleared, giving access to the headquarters of the police, established in the massive ruins of the old bank building, and the Rue Victor Hugo has been cleared southward to give unobstructed connection with the road to Le Carbet and beyond.

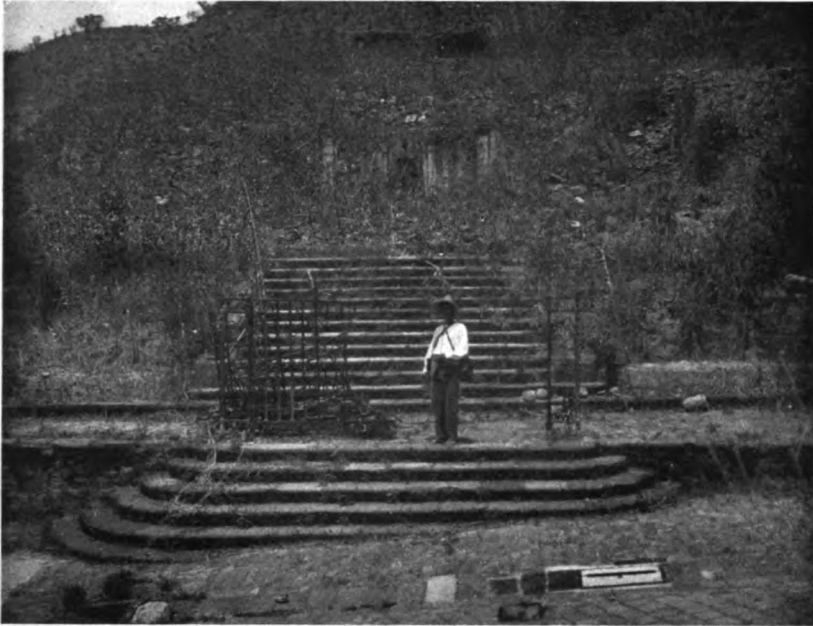
On May 1, we embarked in a canoe for the mouth of the Rivière Blanche to camp in its gorge, down which came the first as well as all the rest of the long series of incandescent dust-laden steam-clouds that burst from the great crater and cone for more than three years. Establishing camp on a little sand plain about two miles from the coast and twelve hundred feet above the sea, I turned my attention first to the neighboring fumaroles or steam vents that extended in an irregular line a quarter of a mile or more toward the crater. The vents nearest the crater registered a temperature of 581 degrees Fahrenheit, while 50



ST. PIERRE, MARTINIQUE. GENERAL VIEW OF RUINS. MAY, 1908.
Looking south-southwest. The prominent ruin in the foreground is part of the military hospital.



ST. PIERRE, MARTINIQUE. RUE VICTOR HUGO, LOOKING SOUTHWARD. MAY, 1908.



ST. PIERRE, MARTINIQUE. RUINS OF THE THEATRE. MAY, 1908.



MT. PELÉ, MARTINIQUE. THE WEST SIDE OF THE VOLCANO IN MAY, 1908.
The line of knolls in the middle ground is the fumarole area of the Rivière Claire. The camp site is about 1200 feet above the sea.

yards from our tents were fumaroles that were just right for use in cooking and we employed one for the purpose. Our camp was a "dry" one, since we were four or five miles from the nearest source of fresh water.

The western and southwestern sides of the mountain present a scene of utter desolation. The sloping plain formed by the débris-filled gorge of the Rivière Blanche is thickly strewn with boulders and angular rock-fragments of all sizes, with here and there a little patch of sand; but not a sign of life, not even a blade of grass or so much as an ant, is visible anywhere. The surrounding hillsides were scored so often and so deeply by terrific blasts from the crater that they too are barren of vegetation. As one goes away, however, from this zone of greatest activity, moss, grass and other vegetation gradually appear in protected and otherwise favorable spots, while upon the other sides of the mountain where the scoring did not take place the slopes are green to the very summit, and large vegetation is rapidly making its way back into the devastated area.

Five days was enough for my work on the southwest side of the mountain, and then we moved camp to the basin of the Lac des Palmistes, the old summit plateau of Mt. Pelé, about 4,000 feet above the sea. Here, in the midst of clouds and buffeted by the heavy trade winds, we set up our tents for another stay of five days, with the idea of being able to improve every moment while the summit might be free from clouds, for the top of Mt. Pelé is densely veiled more than nine-tenths of the time. The recent eruption of the volcano was remarkable partly through the formation in the old crater of a vast new cone of solid rock (not débris) surmounted by a wonderful needle, or spine. The new feature was formed by lava which welled up through the vent, but which was in such a viscous condition that it solidified as it came and therefore rose into the air instead of running down hill. Minor explosions blew away the southwest and northwest quarters of the top of this cone leaving the great spine as a residue. At its maximum development in May, 1903, the point of this spine was 5304 feet above the level of the sea.

The mass, however, was brittle and was rifted in every direction through strains due to contraction. It could not maintain its position and therefore fell to pieces. One may see the great fragments, fifty to sixty feet across, now lying at the base of the new cone in the spiral valley between it and the wall of the old crater. Nearly 900 feet of the mountain top thus fell away, and the present summit is 4,444 feet

above sea level, or only sixteen feet higher than the old Morne Lacroix that once formed the highest part of the mountain, but which was largely destroyed by the eruption.

It is not a difficult matter now to climb the north side of the new cone, but its slope is 37 to 40 degrees from the horizontal, so that the rock fragments composing it are so loose that a slight jar starts them down hill, rendering foothold uncertain and the advance of a party dangerous to the lower members of it. In the top of the new cone, there are great fissures within which the temperature is high. In a branch of one of them my electric pyrometer gave a reading of 515 degrees Celsius, or 959 degrees Fahrenheit. After a shower, steam issues abundantly from the numerous fumaroles of the cone, but between times there is said to be no cloud of vapor, and as far as known no ash has been thrown out since the summer of 1905. The activity of the volcano has been gradually though intermittently decreasing since the great outburst of August 30, 1902, which was the most severe of the whole series, and there seems to be no present indication of another eruption.

EDMUND OTIS HOVEY.

THE INDIANS OF CALIFORNIA.

THE Department of Anthropology has arranged a new exhibit in the series illustrating the chief culture types of North America. The present exhibit, that of the Indians of California, makes the third of the series now in place, the other two, those of the Eskimo and the Indians of the Plains, respectively, having been previously opened to the public. The new exhibit is to be found in the West Hall of North American Types (No. 102 of the Ground Floor).

While the Indians of California are somewhat uniform in their habits and customs, they may nevertheless be divided into three groups: (1) Those of central California, characteristic of the type and represented in this exhibit by the Maidu. (2) Several tribes in northern California, represented in the exhibit by the Yurok. These, while having most of the characteristics peculiar to the Indians of California, have also customs and habits borrowed from Indian tribes farther north. For instance, the Yurok and several other northern tribes lived in rectangular houses with gable roofs, a style borrowed from the houses of Oregon and Washington. (3) Tribes in the southern part of California, represented



MT. PELÉ, MARTINIQUE. SUMMIT OF NEW CONE LOOKING S. 60° W.
 The camp is on the site of the Lac des Palmistes, about 4,000 feet above tide. The remains of Morne Lacroix are seen at the right just above the tent. May, 1908.



MT. PELÉ. THE SPINE OR OBELISK IN MARCH, 1903.
 From practically the same spot as the picture above. The spine rose 5,304 feet above the sea, or 860 feet higher than the top of the present cone.

in this exhibit by the Mission Indians. These took over many practices from the Pueblo and other Indians of the southwestern United States, the making of pottery, an art that was unknown among other Californian Indians, being an example of this.

While the above division can be made, we must understand that the distinctions are not absolute; in fact, the inter-relations of the three main culture types are shown by the existence of mixed types. The Shasta, represented in this exhibit, stand perhaps midway between the central and northern Californian types, emphasizing the fact that after all no hard and fast classification is possible where tribes occupy adjacent geographical areas.

One of the most characteristic features of Californian Indian life is the dependence upon vegetable food, the acorn in particular. Almost every people, whatever the degree of culture, has some food article which takes the place of bread and which is in reality the "staff of life." In California, a kind of bread is made of acorn meal. The various stages of this acorn industry are illustrated by a series of small models to show the gathering of the acorn, its grinding, its leaching by means of hot water, and its drying. In the northern part of California, where salmon are found, fishing is an important industry. A case is being fitted up to illustrate the native methods of catching and treating this fish.

From the artistic point of view, one of the most prominent facts concerning these Californian Indians is their skill in the manufacture of baskets. While basketry is fairly well represented in the present exhibit, it has been given special treatment in the hall above this, on the second floor of the Museum, where will be found a collection of baskets from several parts of California as well as from other regions in North America.

DR. HENRY E. CRAMPTON has been appointed Curator of the Department of Invertebrate Zoölogy in the Museum to fill the place made vacant by the resignation of Dr. William Morton Wheeler. Dr. Crampton has published extensively and is now making researches in experimental biology, under a grant provided by the Carnegie Institution. He will retain an official connection with Columbia University, where he has served as lecturer and tutor, instructor, adjunct professor and professor.

SCHOOL CHILDREN AT THE TUBERCULOSIS EXHIBITION.

THE two photographs on the opposite page show lines of school children entering the north and south entrances of the Museum.

Between January 4 and 15 (ten school days) the Museum received within its doors six thousand children daily. Ushered, a thousand at a time, into the auditorium, they were given facts concerning tuberculosis and personal hygiene preventing it, and directions for study of the International Tuberculosis Exhibition. When dismissed from the auditorium, giving place to a second set of a thousand, they were guided through the exhibition, to watch the light that went out every two minutes thirty-six seconds showing how often someone dies of tuberculosis in the United States, to see dark, dirty rooms contrasted with light and clean ones, to examine many inviting tents for out-of-door living — one very amusing to them because it allowed a person to sleep with his body in the house and his head out of the window. Then from the exhibition the long lines filed into the Bird Group Halls and on to other parts of the Museum. There can be no doubt that the suspension of their school work and the unusual expedition, combined with the serious force of the impression received after reaching the Museum, brought before them with unwonted importance not only the social evil, tuberculosis, but also many matters of personal cleanliness and home sanitation.

* * *

The two weeks' educative work above referred to illustrates one of the large ways in which the Museum serves the people above and beyond its more specific work in science. That the Museum is practicable for direct use in lesser ways also is continually demonstrated. Recently inquiry came for a most resonant wood to be used in the construction of violins. Tests were made in the Forestry Hall, and Douglas spruce was chosen after opportunity for examination of five hundred North American woods. Later another inquirer sought wood absolutely non-resonant for use at the heart of a soundless typewriter. His tests in the Forestry Hall resulted in the choice of palmetto for his purpose. Another instance concerns Peruvian mummy cloths. Probably more than a thousand art students have visited the Museum within the past six years to copy patterns of these cloths or to study their coloring. Many of these students have become successful designers, and as a result numbers of our modern wall papers, rugs and other house-



PUBLIC SCHOOL CHILDREN APPROACHING THE NORTH AND SOUTH ENTRANCES OF THE MUSEUM TO VISIT THE INTERNATIONAL TUBERCULOSIS EXHIBITION.

The average number was 6,000 per day for two weeks.

furnishing goods show some sign of the color combinations and of the fish, bird and cat patterns peculiar to Peruvian mummy cloth. Reports of such instances of direct influence on the art and industries of the country might be multiplied indefinitely, sometimes the need entailing information about precious corals, or some tree advisable for planting in a commercial venture, or sometimes having to do with materials for an artist's sketch of a Sioux maiden, design of grotesque fish or quaint and unusual models for pottery and glass.

MUSEUM NEWS NOTES.

THE Museum is fortunate in having secured the John William Waters collection of ethnological objects from Fiji. The collection comprises about 1800 specimens, including household utensils and implements of war and the chase, made of stone, turtle shell and wood. Mr. Waters lived for forty years on the island, and his knowledge of the people and their customs enabled him to bring together this remarkable collection, the value of which is enhanced by the fact that it represents the life of the Fijians before they had become acquainted with iron and its uses.

THE following members have been elected since the last issue of the Journal: Life Members, MESSRS. HUGH HILL, J. S. MORGAN, JR., and HENRY S. MORGAN, MISSES JANE N. MORGAN and F. T. MORGAN and MMES. J. PIERPONT MORGAN, JR., and DAVIES COXE; Annual Members, MESSRS. A. PERRY OSBORN, A. F. TROESCHER, A. G. VETTER, P. S. TRAINOR, JACOB OLESHEIMER, WM. EDMOND CURTIS, JAMES W. GREENE, R. J. SCHAEFER, GEORGE E. CHATILLON, E. C. KLIPSTEIN, B. G. MEYER, A. C. BECHSTEIN, WASHINGTON L. COOPER, FREDERICK A. LIBBEY, CHARLES H. WEIGLE, C. B. ISHAM, EDWARD H. FLOYD-JONES, JESSE LANTZ and ALANSON P. LATHROP, DR. CHARLES K. BRIDDON, GENERAL HORACE PORTER, MISSES LOUISE D. VAN BEUREN and E. MABEL CLARK and MRS. JAMES A. RUMRILL.

DR. FRANK E. LUTZ has been appointed an assistant curator in the Museum. Dr. Lutz has been an investigator in the Carnegie Institution at Cold Spring Harbor and has published a score or more of papers on the general subjects of Inheritance and Variation.

MR. ALEXANDER PETRUNKEVITCH, an authority on American spiders, has become officially connected with the Museum in the capacity of Honorary Curator of Arachnida. This appointment was made by the Board of Trustees in appreciation of the invaluable service which Mr. Petrunkevitch has rendered the institution for several years through correspondence, exchange and the general enrichment of the collections.

LECTURE ANNOUNCEMENTS.

MEMBERS' COURSE.

The second course of lectures to members of the Museum and their friends will begin February 25 and will be devoted to the Conservation of Natural Resources. Details will be announced in a special circular.

LEGAL HOLIDAY COURSE.

Washington's Birthday, February 22, 1909, at 3.15 o'clock P. M.
No tickets required.

"Some of the Food and Game Fishes of the Eastern United States.—
Habits and Methods of Capture." By ROY W. MINER.

Fully illustrated with stereopticon views.

COLUMBIA UNIVERSITY COURSE.

JESUP LECTURES.

Given in coöperation with Columbia University.
Wednesday, February 3, at 8:15 o'clock P. M.

The last of a course of ten lectures on light by PROFESSOR RICHARD C. MACLAURIN of Columbia University.

"Some relations between light and electricity."

A COURSE IN BIOLOGY.

Arranged by the Biology Departments of the Normal College and the High Schools of Manhattan. Illustrated with stereopticon views.

Thursday afternoons at 3:30 o'clock.

- January 14.**—“American Forests and Their Uses.” By **GEORGE H. SHERWOOD.**
February 18.—“Our Atlantic Fisheries.” By **DR. HERMON C. BUMPUS.**
March 18.—“Public Health.” By **DR. THOMAS M. DARLINGTON.**
April 15.—“Natural History of Animals.” By **DR. HENRY E. CRAMPTON.**

DARWIN MEMORIAL CELEBRATION.

HELD in coöperation with the New York Academy of Sciences.
Friday, February 12, 3:30 o'clock P. M.

Addresses will be delivered as follows:

Presentation to the Museum of a bronze bust of Darwin by **CHARLES FINNEY COX**, President of the Academy.

Acceptance on behalf of the Trustees of the Museum by **HENRY FAIRFIELD OSBORN**, President of the Museum.

“Darwin and Geology,” by **JOHN JAMES STEVENSON.**

“Darwin and Botany,” by **NATHANIEL LORD BRITTON.**

“Darwin and Zoölogy,” by **HERMON CAREY BUMPUS.**

PEOPLE'S COURSE.

GIVEN in coöperation with the City Department of Education. **Illustrated** with stereopticon views.

Tuesday evenings at 8 o'clock.

February 2.—**IAN C. HANNAH**, “Japan's Transformation.”

February 9.—**IAN C. HANNAH**, “America as an Asiatic Power.”

February 16.—**Mrs. LUCIA AMES MEAD**, “World Organization.”

February 23.—**ISYA JOSEPH, Ph.D.**, “Mohammed and Mohammedanism.”
(Illustrated with costumes.)

Saturday evenings at 8 o'clock.

February 6.—**H. A. SMITH**, “National Forest Policy.”

February 13.—**OVERTON W. PRICE**, “Conservation of Natural Resources.”

February 20.—**PROFESSOR H. E. GREGORY**, “The Life History of a Lake.”

February 27.—**CYRUS C. ADAMS**, “Earthquakes.”

Children are admitted to these lectures only on presentation of Museum Members' tickets.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy.

Second Mondays, Section of Biology.

Third Mondays, Section of Astronomy, Physics and Chemistry.

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York, The New York Entomological Society and the Torrey Botanical Club.

On Wednesday evenings, as announced:

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.

FRANK M. CHAPMAN,
LOUIS P. GRATACAP,
WILLIAM K. GREGORY, } *Advisory Board.*

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Act of Congress, July 16, 1894.



THE MEMORIAL BUST OF CHARLES DARWIN.
Presented by the New York Academy of Sciences, February 12, 1909.

The American Museum Journal

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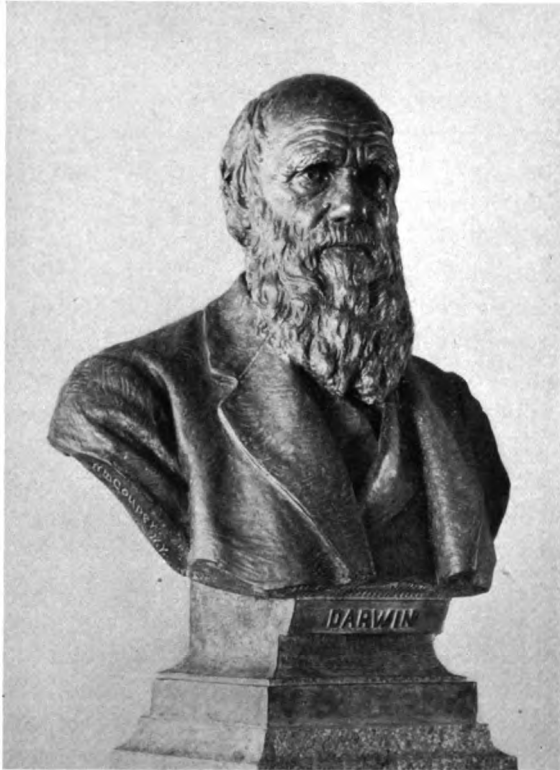
THE DARWIN CELEBRATION.

THE one hundredth anniversary of the birth of Charles Robert Darwin and the fiftieth anniversary of the publication of "The Origin of Species" were celebrated by the New York Academy of Sciences on February twelfth at the American Museum of Natural History. The occasion was made memorable by the unveiling of a bronze bust of Darwin, the Academy's gift to the Museum; also by the dedication of the Synoptic Hall of the Museum as "The Darwin Hall of Invertebrate Zoölogy," with the unveiling of bronze tablets thus inscribed at either side of the entrance from the Hall of Forestry. The bust was presented by the Academy's president, Charles Finney Cox, and was accepted on behalf of the trustees of the Museum by President Henry Fairfield Osborn.

The bust is pronounced by those who knew Darwin personally, and by his sons in England, who have seen photographs of the clay model, the best portrait in the round of the great naturalist ever made. It is the work of William Couper, sculptured from photographs taken when Darwin was fifty years old, at the time of the publication of "The Origin of Species." President Osborn's acceptance of the bust, as a valuable work of art and as an expression of appreciation by the New York Academy of both the technical and the directly educational work of the Museum, gives this impressive likeness of Darwin permanent place in the Darwin Hall of Invertebrate Zoölogy. Here it will stand to testify to Charles Darwin's method of scientific study, namely, a humble and direct approach to nature, in self-reliance and with independence of thinking. The speakers of the afternoon, representing Geology, Botany and Zoölogy, and each claiming Darwin as the inspiration to freedom of thought in the given science, were Professors John James Stevenson, Nathaniel Lord Britton and Hermon Carey Bumpus.

But a few years ago, even to consider the question of evolution was held to be irrational and immoral, not only by the world at large, but also by the intellectual world, with the exception of a small body of scientists.

The change has come since the appearance of "The Origin of Species" in 1859, and outside of the scientific centers at Philadelphia, Boston, Washington, New Haven and New York, it has seemed to come slowly; but the effect has been cumulative, and to-day thinkers in all lines accept the fact of evolution. In the first ten years after 1859, many of the older scientists ignored or fought the doctrine bitterly. Even Agassiz remained



FRONT VIEW OF DARWIN BUST.

on the side of the creation of each species as we find it. Asa Gray, however, who knew Darwin personally and who had published a review of "The Origin of Species" before a copy reached America, stood firmly not only for the theory of evolution, but also for that which Darwinism signifies, the theory of Natural Selection as the working process of evolu-

tion. He inspired the younger men in the Boston scientific center, Shaler, Verrill, Packard, Morse, Hyatt, Allen and Scudder, and through their influence enthusiasm for Darwinism grew until a climax was reached in 1876. Since that date every biological worker in the country has found his research an item to strengthen belief in evolution, and



PROFILE VIEW OF DARWIN BUST.

also, it is true, often to expose some weakness or mend some flaw in the doctrine of Natural Selection.

Darwin, however, did not consider his work faultless, final or complete. In his day the general theory of evolution was already well established in many scientists' minds, due to the work of anatomists such as Lamarck and Cuvier. Darwin marshalled the facts that the

world could then give, to formulate clearly and boldly a possible explanation of the method by which evolution had produced existing life forms. From the geometric increase in numbers due to the normal rate of reproduction of plants and animals, there resulted a struggle for existence, a three-fold struggle (1) with the environment, which not only brought the animal the ordinary exigencies of life, but also perhaps presented suddenly wholly new problems due to some geological change during the earth's history, (2) with members of the same species in search of homes and food and (3) with direct enemies. Since all forms vary at birth, some were less well fitted for the struggle than others; they died for lack of food or were killed by enemies; those better fitted survived. Thus the best fitted for life in a given region became the parents of the next generation, and, if the environmental conditions remained unchanged for many generations, heredity brought about a better adapted race, a "nature selected" race, and, what is the important and contested point, a new variety or species, that is, a race different from the ancestral one. Thus, according to Darwinism, new species come about through slow, minute and cumulative changes. One of the strongest pieces of work done since Darwin's time, that of Hugo de Vries, proves that species may come into existence abruptly also, by large changes or "mutations," de Vries holding that the mutation theory supplements Natural Selection but does not supplant it.

Whether, however, Darwinism lives in the future, or fails under the critical scrutiny of the army of working scientists and in the light of a vast aggregation of new facts, Darwin's position of eminence cannot be assailed. He stands for supreme service to mankind in that he forced into the world of organized knowledge love of truth and abhorrence of slavery to tradition. He was a great seer in a scientific world where practically all was new ground. He was a "naturalist," one of the few deserving the name, with masterly grasp of all known facts in the various branches of natural science. Since his time each of these branches, botany, zoölogy, geology, has grown until it seems that no one mind can comprehend the details of even one of them. The result is that to-day every man is working on his chosen problem, and often the field of that problem is extremely limited, though it involves weighty principles.

Will there come a second Darwin, again to grasp all nature in clear mental vision? His task would be the same as was Darwin's, though far more difficult because of the larger body of knowledge,—to accept

and organize all accumulated information, while at the same time holding his own opinions and formulating his own theories. The work of the new Darwin would marshal to the front or banish to oblivion the many tangled theories of the present, and all so clearly and convincingly that there would be forced upon him who reads a repetition of the effect of "The Origin of Species," the conviction that, after all, the task was an easy one, for there could be no other conclusion.

An important feature of the celebration is the special exhibition in the Hall of Forestry and the new Darwin Hall comprising carefully selected specimens and groups of specimens bearing upon the Darwinian theory of Evolution through Natural Selection; also a valuable collection of Darwiniana consisting of letters, writings and portraits of Charles Darwin, as well as a series of photographs of Darwin's contemporaries. The exhibition is open free to the public and will remain in place till March 12.

NEW HABITAT GROUPS OF NORTH AMERICAN BIRDS.

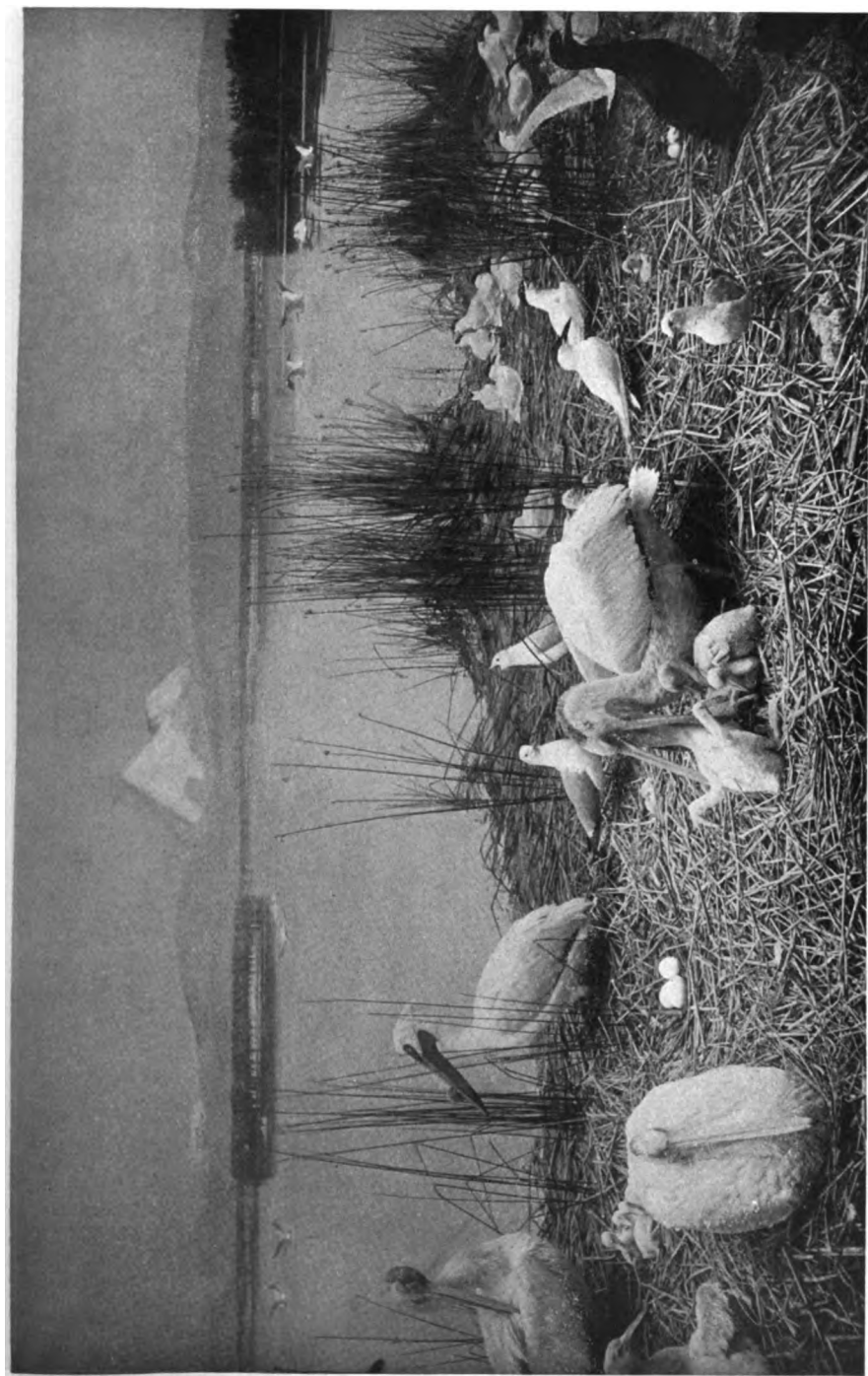
THE high degree of realism and artistic effect achieved in the installation of the Habitat Groups of North American Birds is unique in Museum exhibition. Begun in 1898 with the Bird Rock Group of the Gulf of St. Lawrence, and now nearing completion, the series has entailed a large amount of travel and study on the part of Mr. Frank M. Chapman, Curator of Ornithology, and invaluable assistance on the part of the Museum's taxidermists and artists.

Conceive the ingenuity and labor involved in imitating, accurately as to locality, flawlessly as to workmanship, the snow or water, rocks and vegetation of from sixty to one hundred sixty square feet of a given region; then so to blend the real foreground with a painted background that, quite as in nature, the eye passes from the flowers and birds near at hand, to meadows that stretch to the horizon or to mountains and sky.

The east side of the Bird Group Hall has been previously opened to the public. The west side was opened formally to Members of the Museum on February 26 to mark the completion of six new groups, a demonstration of the method of construction being given by the Cuthbert Rookery Group, only partly finished at that time. On the following day the gallery was thrown open to the general public.



BOOBIES AND MAN-O'-WAR BIRDS ON CAY VERDE.
Background by Bruce Horsfall. Birds by Herbert Lang.



A KLAMATH LAKE BIRD COLONY.

Background by Carlos Hittell. Birds by Herbert Lang.



ARCTIC-ALPINE BIRD-LIFE IN THE CANADIAN ROCKIES.
Background by Carl Rungius from a sketch by L. A. Fuertes.

To view the scene of the first of these new groups we must make the long journey to the Bahamas and there search out Cay Verde. This is a small coral islet with no fresh water, and with the dark blue of great sea depths sharply separated from the light water of its shallow banks. The islet is of peculiar interest since it lies in the line of migration, and being the only landing place in a large expanse of water, receives calls from many migrating birds. Two species, the Booby and the Man o' War bird, nest there in large numbers in March, the Boobies on the ground, the Man o' War birds in the sea grape and prickly pear cactus of the islet. Boobies are particularly tame when on the nests. This is due in part to the fact that they have had no opportunity to learn fear of man, but in addition it probably results from the strength of their parental instinct, which so controls their fear that they do not leave their nests when an intruder walks among them and makes intimate acquaintance with family after family.

The male Man o' War bird is ornamented with a large throat-pouch of vivid red, which, inflated like a toy balloon, makes the bird conspicuous whatever its environment. This ornamentation, actually disadvantageous in the struggle for existence, furnishes an illustration for Darwin's Sexual Selection theory. To-day, all recognize the matter of ornamentation among animals as one of the most difficult of biological problems, whether tentatively accounting for it on this theory of the female's choice of the most attractive, or as a direct physiological and structural result of the male's excessive energy, or by yet other theories.

If we move to the second of the new groups, we are transported thousands of miles across the continent and north to the California-Oregon boundary line, where the shallow water of Klamath Lake contains many islands of rushes and is surrounded by treeless hills with Mt. Shasta in the distance. It is a picturesque place, but much of the region will be drained by a government reclamation project and converted into orchards and fields of alfalfa. The Klamath Lake group shows Cormorants and Gulls, also Caspian Terns; but interest centers in the White Pelicans, immense birds with wing expanse of from eight to nine feet. There are interesting studies of flying Pelicans, and in the foreground one young bird is illustrating its amusing method of fishing down its parent's throat. One adult shows the bill-knob of the nuptial season. It will be a matter of regret if the demands of civilization push this bird to extinction. Unlike many birds, to which advance in civilization

means merely more food and fewer enemies, the Pelican is too specialized for survival; it can adapt itself only to insular life and an abundance of fish. It must be saved through the creation of government reservations for the purpose. An important step toward the protection of western water-fowl was taken by President Roosevelt in August, 1908, when he set aside the Lower Klamath Lake and Lake Malheur Reservations.

The third group carries us to the Canadian Rockies at Ptarmigan Lakes. In the foreground are White-tailed Ptarmigans in mixed white and brown plumage, for it is the height of the Alpine Spring (July 15) and the birds' white plumage of Winter is giving place to the summer coat. A nest of five spotted eggs is set among gray rocks and lichens, only a few feet from the border of an unmelted snowfield, yet surrounded by the star-like flowers of *Dryas*, by heather in bloom and by anemones two inches across. One Ptarmigan is shown with six downy chicks in spirited attitudes. The apparent fragility but real endurance of this life is enhanced by what is to be seen on lifting the eyes from the ground, a circle of austere snow-covered mountain peaks and, far below, the ice and blue water of an opening lake.

The Ptarmigan is a boreal type. It is found as far south as New Mexico, but only at high altitudes, the species possibly having survived in these Arctic-Alpine regions when left stranded there by the retreating ice of the Glacial Period. Ptarmigans not only present one of the most striking cases of coloration like the environment of the season, nor only an instance of gradation of color from above downward to counteract the shadow gradation from below upward and produce the effect of unsubstantiality, but they also have correlated with this color protection, the instinct to remain motionless in the face of the enemy.

The fourth group, showing the Sage Grouse, keeps us in the West, descending from Alpine regions to the high sage-brush plains of Wyoming. The Sage Grouse is the largest of North American game birds with the exception of the Wild Turkey. The group illustrates some of the remarkable performances of the birds at the mating season.

The remaining two groups, representing the Western Grebe and the Wild Goose, show the rolling treeless plains of Western Canada, at Crane Lake, Saskatchewan. The Grebe group illustrates instincts such as always prove a lure afield to the bird student. One parent bird is swimming in stately fashion, while, peeping from the warm cradle between her back and wings, four eager and contented young birds are



SAGE GROUSE IN WYOMING.

Background by Carlos Hittell. Birds by Herbert Lang.



GREBES (UPPER FIGURE) AND WILD GOOSE (LOWER FIGURE) ON CRANE LAKE,
SASKATCHEWAN.

Backgrounds by Hobart Nichols. Birds by Herbert Lang.

taking a sail with her; another parent bird is covering her nest of eggs preparatory to leaving it; everywhere the birds swim with their long necks erect so that the perpendicular lines of black and white resemble the surrounding reeds and reflections. The Western Grebe is slaughtered mercilessly by plume hunters, the birds' snow-white breasts appearing in market in capes and muffs and on hats.

The Museum acknowledges its large indebtedness for this series of Bird Habitat Groups to the generosity of several of its members, but particularly to the following: Mr. John L. Cadwalader and to Mrs. Morris K. Jesup, Mrs. Philip Schuyler, Mrs. John B. Trevor, Mrs. Robert Winthrop, Mr. F. Augustus Schermerhorn, Mr. H. B. Hollins, Mr. Henry Clay Pierce, Mr. Henry W. Poor, Mr. Charles Lanier and Mr. Courtenay Brandreth.

THE ANNUAL MEETING OF THE TRUSTEES.

AT the Annual Meeting of the Board of Trustees of the Museum, held on Monday, February 8, the following officers were elected for the ensuing year: HENRY FAIRFIELD OSBORN, President; J. PIERPONT MORGAN, First Vice-President; CLEVELAND H. DODGE, Second Vice-President; J. HAMPDEN ROBB, Secretary, and CHARLES LANIER, Treasurer. The following abstract of the president's annual report will be of interest to the Members.

In point of growth the past year has been the most notable in the history of the institution. Partly aided by the Jesup bequest, the total expenditures were \$275,419, or \$25,000 more than the previous year. Of this the city contributed \$159,930.62 and the Museum \$115,488.38. In the past eight years the Museum has expended directly \$932,008 on its explorations and collections. The estimated total value of the collections secured during this period by exploration, by purchase and by gift to the Museum is more than \$2,000,000. For every dollar which has been expended by the city, more than a dollar has been added to the enlargement of the collections.

The present endowment fund, including the bequest of the late President Jesup, is \$2,048,156.61. To keep pace with the very rapid growth of the city and the demands it is making for public scientific education, an endowment fund of \$5,000,000 is needed. In every

part of the world the advance of agriculture and commerce and the spread of fire arms is rendering more scarce the objects of natural history of all kinds, including the works of the primitive races of men. It is deemed vitally important to push the explorations of the Museum in all parts of the world, while it is still possible to secure these fast vanishing works of nature and of primitive man. During the year 1908 and at the present time the Museum's explorations extend to the Mackenzie River and the shores of Beaufort Sea, to Alaska, Vancouver, Alberta and Saskatchewan, the west coast of Hudson Bay and western Labrador; in the United States parties have been spread in Wyoming, Montana, Idaho, North Dakota, Nebraska, Colorado and Florida, also in Central America, and in the south to Nicaragua, the West Indies and Bahama Islands; in Asia special agents are working in Kashmir, China and Corea; among the islands of the Pacific the Museum is working in the Philippines, the Solomon Islands, Tahiti, New Zealand, the South Shetland Islands and Kerguelen Island.

Popular education has been given a stronger impulse than ever before. The Museum was open free to the public every day of the year and on 179 evenings. The gross attendance last year was 1,043,562, in large part due to the exceptional interest in the International Tuberculosis Exhibition. The attendance at public afternoon and evening lectures reached a total of 82,718. The number of children visiting the Museum in lecture classes was 10,325. The number of children who were especially guided through the Tuberculosis Exhibition and who listened to lectures on simple means of prevention of this disease was 41,627. These children came from all the high schools of Greater New York and from many distant towns and cities. In the schools of the city 575,801 children were reached by the system of the circulating nature study collections.

During the coming year the principal new exhibitions which will be developed are, in particular, the Children's Museum, the Museum for the Blind, the Philippine Exhibition and the Congo Exhibition presented by King Leopold of Belgium. The last is the most complete collection outside of that which is to be seen in the Congo Museum near Brussels. As a result of the Tuberculosis Exhibition immediate steps will be taken to make a special exhibition of the life and habits of the smaller organisms in relation to health and disease.

THE STEFÁNSSON-ANDERSON ARCTIC EXPEDITION.

LATE in February, a welcome letter was received from Mr. Vihljalmi Stefánsson, who, together with Dr. R. M. Anderson, was sent by the Museum last summer to make ethnological, geographical and biological studies along the arctic coast of North America in the vicinity of the mouth of the Mackenzie River. Mr. Stefánsson writes as follows:

“CAPE HALKETT, ALASKA, Sept. 25th, 1908.

“On my way east along the coast I have just come upon Capt. William Mogg’s vessel, the “Olga,” frozen in the ice off shore at Halkett. [Long. 152° W.] The captain will abandon his ship next Tuesday. * * * *

“I have not my diary with me — it is at our camp on shore and I am at Capt. Mogg’s ship three miles off shore in the ice — so I cannot give exact dates, but we left Point Barrow about August 29th or 30th. We had head winds and foggy weather and finally froze in [at] Smith Bay September 6th — very bad luck; some years boating is good till October 1st or after. We could do nothing but prepare safe caches on shore for our stuff until the ice was strong enough for sled travel September 18th, when we started east. We soon came to weaker ice, however, and had to delay and go slowly, so we are only this far by now, but hope for better traveling.

“Dr. Anderson I suppose to be safe either at Barter Island or inland from there, looking for deer and mountain sheep. I hope we shall be down to him in some 10 days from now. All we shall bring, however, is tobacco and matches, for we had only four dogs with us, and succeeded in making only an indifferent sled out of driftwood. If we fail in hunting and fishing to the eastward we shall probably — some of us at least — retreat upon our cache in Smith’s Bay and be able to turn a penny trapping while we eat up the flour, etc.— for it is an excellent fox country, though there are no people, because there are no food animals.

“I expect I shall get to Herschel Island in time to write you by the police mail, and you should get the letter about as soon as this one, while I should be able to give in it more information as to ourselves. Seeing, however, that one of our whaleboats is frozen in so far west, I hope, among other things, that we can get together a good collection — perhaps several hundred skulls — of bones from the ancient graveyards along the sandspit between Point Tangent and Point Barrow. I saw over a hundred (on top the ground) in a walk through one of them when we were ashore in a calm coming east. We shall also almost certainly be able to do some good digging on the island just

east of the Colville Mouth from which I last year got a few specimens for the Peabody Museum, * * * * * As to getting to Prince Albert Land or Coronation Gulf, I think there is no reasonable doubt of it for next year — “barring accidents” and such unparalleled hard luck as everybody has had up here this year.

“Near Point Tangent a trading schooner passed us going east and I got them to take 27 sacks of flour and some other stuff for Dr. Anderson, but Capt. Mogg tells me she probably did not get within some 60 miles of Barter Island — certainly not farther than Flaxman and probably not so far. That will be well enough for us, for the nearer the Colville the better.

“I met the other day an Eskimo who used to live in the Colville. From him I got a map which should enable me to locate at least three families of the Colville group this winter — so the Colville plans are all right, so far, except their expensiveness, as previously confessed from Point Barrow. * * * * *”

RECENT PURCHASES OF FOSSIL VERTEBRATES.

THE Department of Vertebrate Palæontology has recently purchased from Mr. Charles H. Sternberg, the well known collector, a number of important fossils. Chief of these is a unique specimen — a “mummied” Dinosaur, as President Osborn has aptly called it. It is a nearly complete skeleton of the Trachodon or Duck-billed Dinosaur, in which not only the bones but also the greater part of the skin of the head, body and limbs is preserved intact. As found in a soft sandstone stratum near Lance Creek, Wyoming, the skeleton lay on its back, the head turned to one side, the fore limbs stretched out, the hind limbs doubled up close to the body. Over head, neck and limbs lies the thin curtain of skin, shrunk down tight upon the bones and sunken in over most of the body cavity below the ribs.

At first glance, the skin seems to have irregular rows of small spots over the surface, the spots being about the size of a half dollar or less. On closer examination, each spot is seen to be made up of a number of little polygonal plates, like the pieces of a mosaic, with innumerable smaller plates filling the interspaces between the spots. There are no overlapping scales such as cover most modern reptiles, nor anything like the smooth or hairy skin of mammals or the feathered skin of birds. The dinosaur skin is *sui generis*,— completely unlike that of any modern

animal. A part of the tail of the same species, now on exhibition in the Dinosaur Hall, shows a considerable area of skin, much like that of this skeleton, but with larger plates and no distinct pattern of spots. Traces of the skin are preserved in several other kinds of extinct reptiles, but nothing has been found that compares with this in its perfect preservation.

To all appearances, the animal must have died on some dry, sandy spot exposed to the sun, so that the carcass dried and shrank to a natural mummy. Then it must have been suddenly buried by a flood of sand from a freshet, so rapidly and deeply that the skin had no chance to soften and decay, but was preserved and petrified with the bones. This occurred three million years ago, on a moderate estimate of geologic time. We think of the mummies of Egypt, three or four thousand years old, as being of respectable antiquity. Still more venerable are the mammoths which have been found buried in the frozen tundras of Siberia and Alaska, and their outward appearance thus preserved to our day. But even the mammoths, tens of thousands of years old though they be, are mere creatures of yesterday, modern upstarts, compared with the hoary antiquity of this dinosaur mummy.

It will be a matter of several months' work to complete the preparation of this specimen for public exhibition, but, when finished, it will do more than any mere skeleton or pictured restoration to impress upon us the reality of the ancient world of the Dinosaurs.

Two other specimens purchased from Mr. Sternberg are marine reptiles from the Kansas chalk beds, a little older than the formation in which the *Trachodon* was found. One is a skeleton of the marine turtle *Toxochelys*, the other a fine skull of the Mosasaurian or swimming lizard *Clidastes*. There are also two specimens of comparatively recent geological age, one a fine skull of the extinct long-horned bison, six feet from tip to tip of the horns, and a lower jaw of the Imperial Mammoth,—both from the Pleistocene of Kansas. Two huge tortoises from the Miocene beds of Kansas and the skull of a small rodent related to the beaver, but of burrowing habit, are likewise included in the collection.

Mr. Sternberg is a genuine enthusiast in searching for these memorials of the former history of the world we live in, and it is a satisfaction no less to himself than to the American Museum to see these fine specimens placed where they will be seen and appreciated by thousands of visitors each year. He has already contributed to our collection some notable specimens and many fossils of much scientific interest. M.

MUSEUM NEWS NOTES.

THE following members have been elected since the last issue of the Journal: Patron, MR. W. K. VANDERBILT; Life Members, MESSRS. NORMAN B. REAM, JOHN S. KENNEDY, ALEXANDER WALKER and JOHN J. WILLIAMS and MRS. E. A. SLAVEN; Annual Members, MESSRS. FITZ ROY CARRINGTON, EDWIN PARSONS, PERCY R. PYNE, 2d, RICHARD SUTRO, D. S. RAMSAY, F. S. SMITHERS, ALFRED G. VANDERBILT, GEORGE HAMILTON DEAN, WILLIAM T. HILLES, CHARLES E. SEITZ, A. H. WRAY, ADOLPH RIESENBERG, L. WILLIAM HERR, JAMES I. BARR, WILLIAM B. HORNBLOWER and CHARLES E. PARSONS, DOCTORS HERMANN M. BIGGS and EDGAR S. BARNEY, HON. HUGH J. GRANT and MMES. C. C. AUCHINCLOSS, THOMAS KIRKPATRICK, HELEN C. ROBBINS and J. A. VANDERPOEL.

THE Museum is preparing a Philippine Exhibit for the United States War Department. It is intended to cover the ethnology of the Islands and also to give especial attention to Philippine agricultural and industrial conditions since 1898, the date of American occupation. The exhibit will be set up at the Museum and then forwarded to Seattle, where it is to be displayed at the Alaska-Yukon-Pacific Exposition.

PROFESSOR AARON L. TREADWELL, of Vassar College, has been appointed Honorary Curator of Annulates.

SCIENTIFIC PUBLICATIONS IN 1908.

THE scientific publications of the Museum in 1908 comprised Volume XXIV and Volume XXV, Part I, of the BULLETIN, Volume X, Part II, and Volume XIV, Part II, of the MEMOIRS and Volume I, Parts IV, V and VI and Volume II, Part I of the new series of ANTHROPOLOGICAL PAPERS.

The articles contained in these various publications are technical in character, but many of them have general as well as scientific interest, and their titles are given in the following list. They indicate in part, the scope of the activity of the Museum staff in research in several departments of natural science. The articles are published separately and, like the complete volume, may be obtained from the librarian except as indicated.

THE BULLETIN, VOLUME XXIV.

(Thirty-three plates and 167 text figures.)

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LECTURE ANNOUNCEMENTS.

MEMBER'S COURSE.

THURSDAY evenings at 8:15 o'clock. Doors open at 7:45 P. M.

The second course of illustrated lectures for the season 1908–1909 to Members of the Museum and persons holding complimentary tickets given them by Members will be given in March and April according to the following programme:

- March 4.—“Birds in Their Relation to Man.” By MR. FRANK M. CHAPMAN, Curator of Ornithology in the American Museum of Natural History.

What the Bird does for the State. The bird and the forester; the bird and the fruit-grower; the bird and the farmer; the bird and the citizen; the bird and the nature-lover.

What the State does for the Bird. Bird destruction for pleasure and for profit; influence of increasing population on bird-life.

What the State should do for the Bird. Bird conservation by law and by creating favorable environmental conditions.

- March 11.—“The Conservation of Our Rivers and Lakes.” By MR. CHARLES H. TOWNSEND, Director of the New York Aquarium.

Mr. Townsend will speak on the importance of our fresh waters for fisheries, town water supply, water power, irrigation, navigation and recreation; the dangers which threaten them on account of pollution and deforestation; the remedies which may be applied through sewage disposal, fish culture, impounding of waters, protection of the watersheds and the development of navigable waterways.

- March 18.—“The Conservation of Natural Scenery in America.” By MR. J. HORACE MCFARLAND, President of the American Civic Association for a Better and More Beautiful America.

The address will deal with the value of natural scenery in its effect on the human mind, and with the danger of inconsiderately destroying natural beauty in that

change of scenery which comes about from exploitation of our American resources. Mr. McFarland will speak of the Grand Canyon of Arizona, of the Yosemite National Park, of the Falls of Niagara, of the Panama Canal, and of other development and conservation in which we have paid no attention to the beauty of our natural scenery.

March 25.—“Conservation from the Palisades to the Adirondacks.” By
MR. EDWARD HAGAMAN HALL, Secretary of the American
Scenic and Historic Preservation Society.

According to the old style of reckoning, March 25, 1909, will be the 300th Anniversary of the departure of Henry Hudson from Amsterdam on the voyage which brought him to the Hudson River. This fact gives especial propriety to the subject of conservation of the natural resources and landscape beauties of the famous river which rises in the Adirondacks and flows past the Palisades to the sea.

April 1.—“The Passing of Our Great Wild Animals and Means taken to
Restore Them.” By DR. WILLIAM T. HORNADAY, Director
of the New York Zoölogical Park.

Dr. Hornaday is in touch with the majority of the game regions of the world, and for thirty years has carefully watched the decrease of wild life. He will point out that everywhere the larger mammals are being killed much more rapidly than they breed, and that to-day the only hope for the preservation of many important species is absolute protection in game preserves. A few illustrations will be shown of an ideal game preserve very recently created in British Columbia for the sheep, goat, elk, mule-deer and grizzly bear.

PUPILS' COURSE.

THESE illustrated lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on the presentation of Membership tickets.

Lectures begin at 4 P. M.

	Mch.	Mch.	
Monday,	8	29.	—“New York City in Colonial Days.” By R. W. MINER.
Wednesday,	10	31.	—“Japan and Her People.” By LOUIS HUSSAKOF.
	Apr.		
Friday,	12	16.	—“The Panama Canal.” By E. O. HOVEY.
Monday,	15	19.	—“Famous Rivers of the World.” By WALTER GRANGER.
Wednesday,	17	21.	—“Natural Wonders of Our Country.” By R. W. MINER.
Friday,	19	23.	—“American Forests and their Uses.” By G. H. SHERWOOD.
Monday,	22	26.	—“Mediterranean Countries, Ancient and Modern.” “By WALTER GRANGER.

- Wednesday, 24 28.—“The American Indian of To-day.” By H. I. SMITH.
 Friday, 26 30.—“Travels in the Western States.” By BARNUM BROWN.

LECTURES ON BIOLOGY.

ARRANGED by the Biology Departments of the Normal College and the High Schools of Manhattan. Illustrated with stereopticon views.

Thursday afternoons at 3:30 o'clock.

Two lectures remain to be given.

- March 18.—“Public Health.” By DR. THOMAS M. DARLINGTON.
 April 15.—“Natural History of Animals.” By DR. HENRY E. CRAMPTON.

PEOPLE'S COURSE.

GIVEN in coöperation with the City Department of Education.

Tuesday evenings at 8 o'clock. Doors open at 7:30.

Three lectures by PROFESSOR A. D. F. HAMLIN of Columbia University on “The Architecture of Great Cities.” Illustrated with stereopticon views.

- March 2.—“Rome.”
 March 9.—“Constantinople.”
 March 16.—“Venice.”
 March 23.—“History of Architecture as seen in New York Buildings.”
 By MR. JOSEPH M. TILDEN.

Three lectures by PROFESSOR A. D. F. HAMLIN on “The Architecture of Great Cities.” Illustrated with stereopticon views.

- March 30.—“Paris.”
 April 6.—“London.”
 April 13.—“New York.”
 April 20.—“Florence.” By MR. FRANCIS M. STRICKLAND.
 April 27.—“Berlin.” By MR. HENRY ZICK.

Saturday evenings at 8 o'clock. Doors open at 7:30.

- March 6, 13, 20 and 27.—A course of four lectures by MR. O. F. LEWIS on “Modern Methods of Charitable Help.”
 April 3.—“Child Labor.” By MR. OWEN LOVEJOY.
 April 10.—“The Children's Court.” By MR. E. K. COULTER.
 April 17.—Subject and lecturer to be announced.
 April 24.—“The City Beautiful.” By MR. A. A. STOUGHTON.

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy.

Second Mondays, Section of Biology.

Third Mondays, Section of Astronomy, Physics and Chemistry.

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York, The New York Entomological Society and the Torrey Botanical Club.

On Wednesday evenings, as announced:

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.

FRANK M. CHAPMAN,	} <i>Advisory Board.</i>
LOUIS P. GRATACAP,	
WILLIAM K. GREGORY,	

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(Issued as supplements to *The American Museum Journal*.)

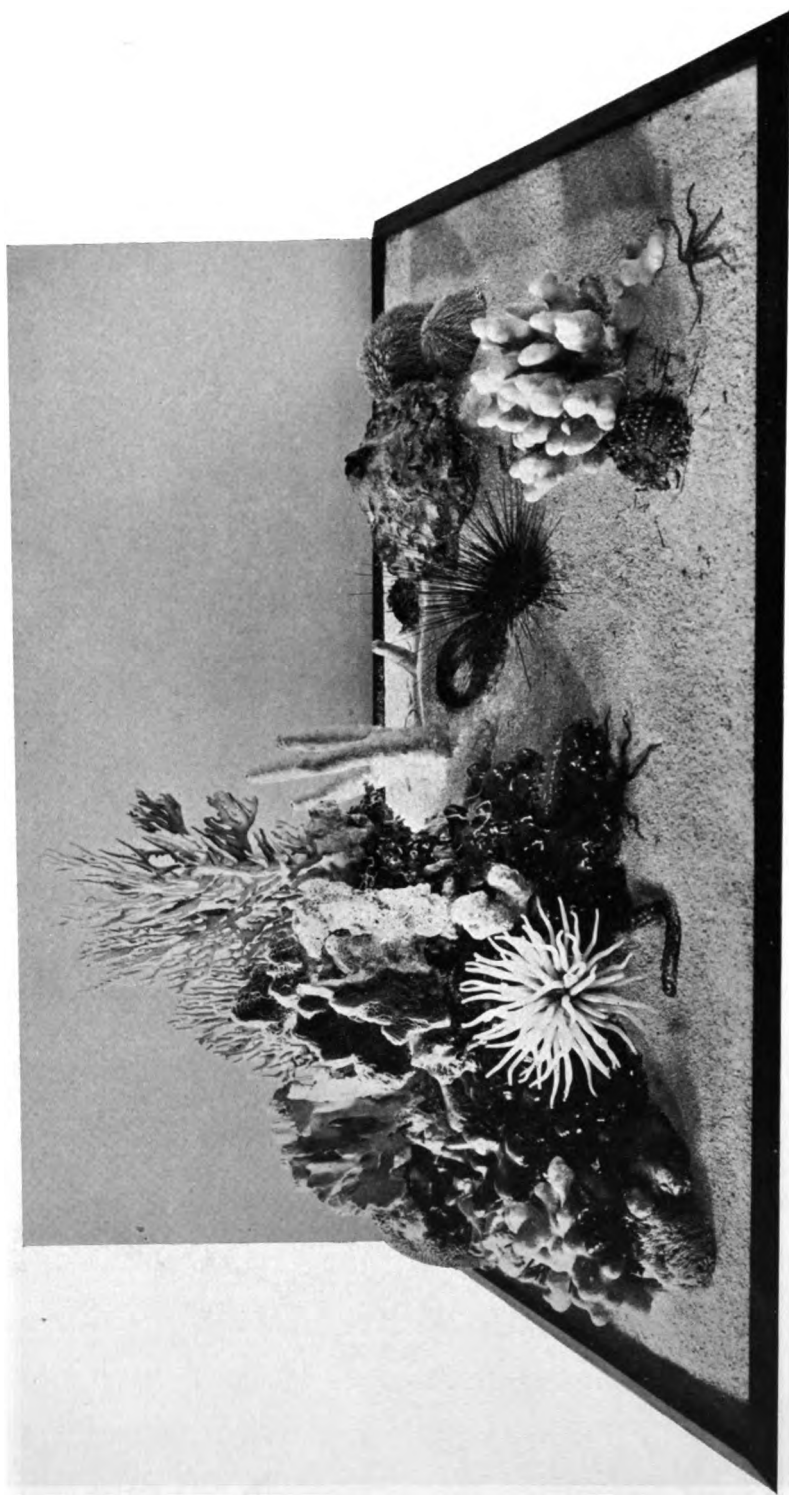
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The American Museum Journal

VOL. IX

MAY, 1909

No. 5

THE SERIES OF PROTOZOAN MODELS.

THE minute one-celled organisms known as Protozoa form a group of immense importance both from a biological and an economic standpoint. Swarming in countless millions in both fresh and salt water, and at times even in the bodies of other animals, they are the most abundant and most widely distributed of all life. Many of the smaller marine and fresh water creatures depend upon them for food, and among them may also be found some of the most important disease-causing parasites. The calcareous and siliceous skeletons of others settle to the sea bottom by thousands as the animals die, to collect in layers often many feet in thickness. The calcareous skeletons sometimes become compacted into solid rock, and thus are of great geological importance, many extensive cliffs of lime-stone and chalk having been formed in this way. The siliceous skeletons form the so-called "Radiolarian ooze," which is the source of the "Barbados earth" used in manufactures for polishing and grinding, and which forms no inconsiderable part of the island of Barbados. Though this vast world of creatures is so important and surrounds us on every side, penetrating, as it were, all the interspaces between the larger forms of life, yet it is invisible to our eyes, and were it not for the compound microscope, we should be absolutely ignorant of it, except in its effects.

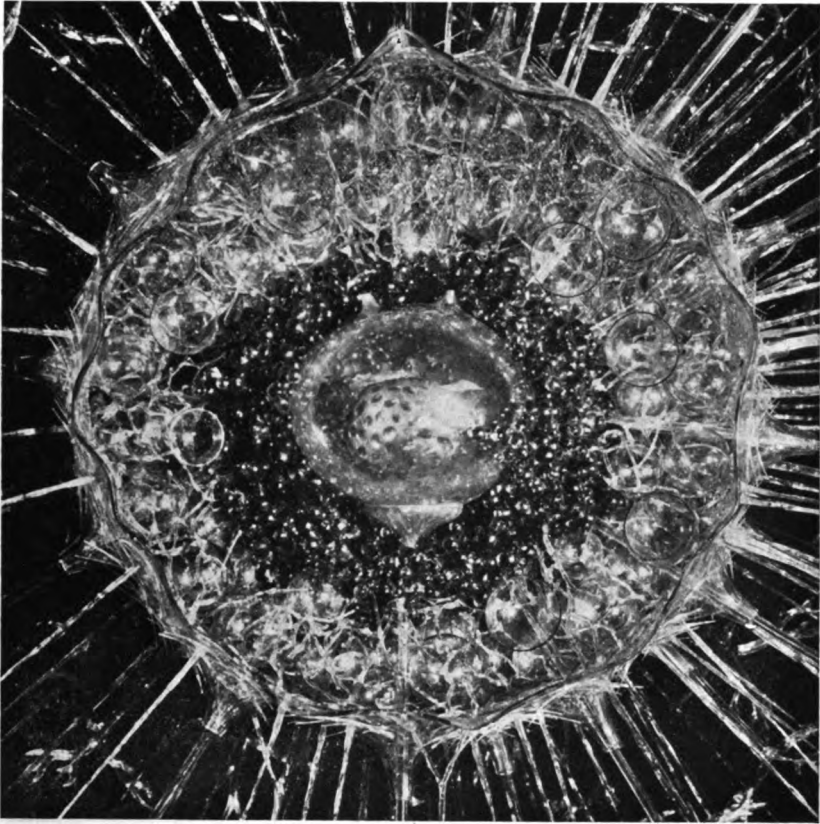
The Museum is at present completing its series of greatly enlarged models of the typical Protozoa, and one of the most striking of these has recently been finished for exhibition. It is shown in the accompanying illustrations (pages 104 and 105). This Protozoan (*Auloceros elegans* Hæckel) belongs to the group Radiolaria, so called because of the radiating siliceous or glassy skeleton which characterizes these forms. Sometimes these are of great complexity and beauty, and though the Protozoa as a whole are the simplest in structure of all animals, being composed of but a single cell, certain forms among the Radiolaria attain considerable complexity of intracellular structure, as may be seen in the figure.

In the middle of the animal is the oval nucleus, which is the essential center of its life activities, and which is itself extremely complex both in structure and in function. It is inclosed in a transparent double-walled "central capsule," in this species red in color, containing a portion of the living protoplasmic cell-substance (*endoplasm*) which is continuous with the surrounding outer protoplasm (*ectoplasm*) through openings at the summits of the three conical projections. The central capsule is partly imbedded in a mass of granular pigmented substance (the



THE PROTOZOAN, AULOCEROS ELEGANS HÄCKEL.

Glass model, greatly enlarged. Made by H. Müller under the direction of R. W. Miner.



MODEL OF AULOCEROS ELEGANS HÄCKEL.

View to show internal anatomy.

phæodium — dark green in this species), which surrounds and apparently issues from the upper opening of the capsule. It is probably of considerable physiological value to the organism and may be either associated with nutrition or a product of an excretory nature retained within the body for some secondary reason. The real explanation of its function, however, is still uncertain.

The true protoplasmic living-substance outside the capsule is distributed for the most part in the form of a network, which secretes and is imbedded in a jelly-like structureless matrix. This matrix is crowded with bubble-like, liquid-filled hollows (*alveoles*), which are so numerous that they reduce the animal substance to very narrow limits and give a foam-like appearance to this part of the structure. (In the glass

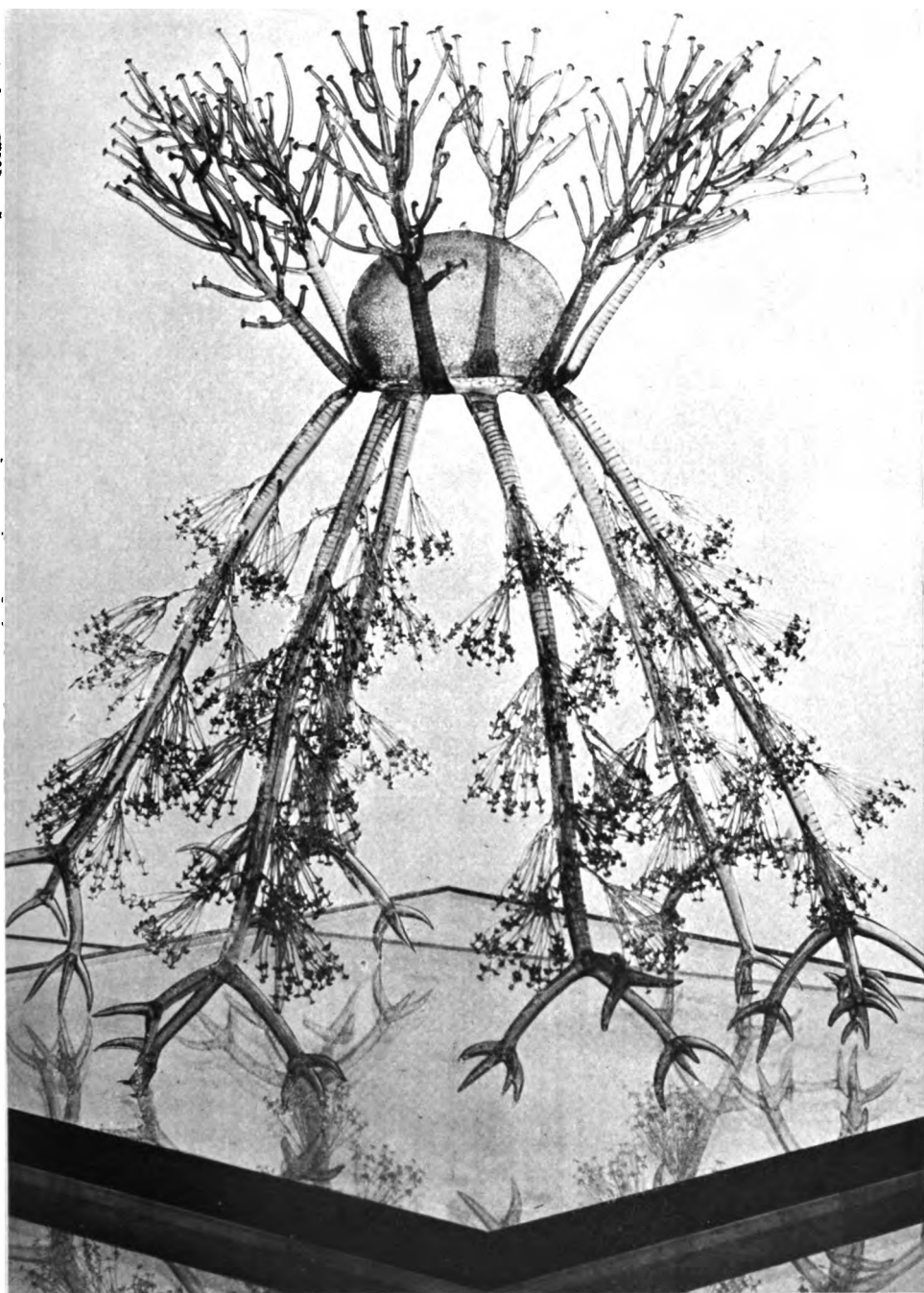
model each alveole is represented by a separately blown glass sphere.) Radiating outward from the central capsule may be seen the supporting glassy skeleton of the creature, each ray in this species separate, and branching antler-like at the tip. Particular notice should be taken of the delicate radiating filamentary projections of the animal body between the rays of the skeletal structure. These are the "pseudopods," prolongations of the living protoplasmic network which reach out in all directions and act somewhat as tentacles, seizing upon the minute animals which form the prey of the creature, and drawing them down within the body to be digested and absorbed. This ingestion may take place at any point of the surface, since there is no mouth and no definite stomach. The pseudopods are used also for locomotion.

In other related species all parts of the skeleton are welded rigidly together, often forming complicated and beautiful patterns, as in the genus *Gorgonetta*, the skeleton of which is represented by a model now on exhibition in the Museum (page 107).

ROY W. MINER.

A NEW MARINE HABITAT GROUP.

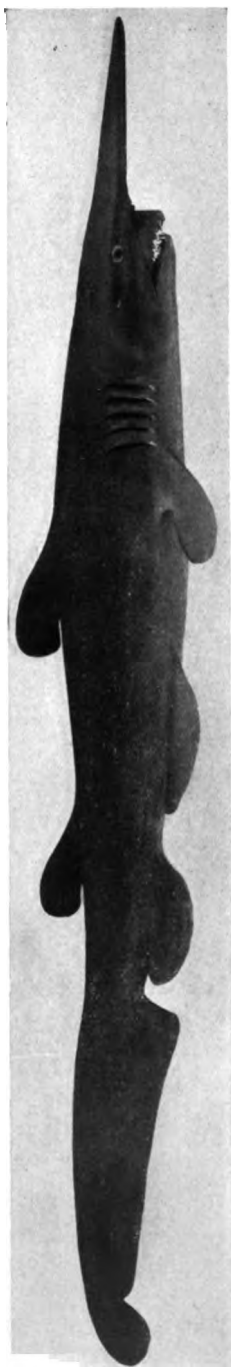
THE illustration on page 102 represents a group recently installed by the Department of Invertebrate Zoölogy. This group shows an animal community such as may often be found in the Bahamas not far below the exposed edge of a coral reef. It includes Brittle-stars, Sea Cucumbers, Cake-urchins and Sea-urchins, especially *Diadema setosum*, two fine specimens of which are represented bristling with long spines, like hedge-hogs. Coiled in and out through the crevices of the coral-rock is the brownish body of a *Synapta*, studded with knobs and displaying around its circular mouth-opening an expanded ring of plume-like tentacles. Conspicuous at one side of the group is the flower-like Pink-tipped Sea Anemone (*Condylactis gigantea* Weinland), which nestles at the base of a coral growth and is partly concealed by the brown slimy surface of an incrusting sponge. Above this rises the delicate fern-like colony of a Stinging Coral (*Millepora alcicornis*) together with a fragile, paper-like species (*Millepora plicata*), while other sponges and corals project here and there from the sand. The material for the group was collected in 1908 by Dr. B. E. Dahlgren and Mr. H. Müller off Andros Island in the Bahamas, and was for the most part prepared by the former in the Museum.



GLASS MODEL OF SKELETON OF PROTOZOAN, GORGONETTA MIRABILIS HÄCKEL.

Very greatly enlarged. Prepared by H. Müller.

MODEL OF THE GOBLIN SHARK.



THE GOBLIN SHARK.

A LIFE-SIZE model of a very rare and remarkable Shark from Japanese waters, a photograph of which is shown on this page, has recently been finished for exhibition in the Museum. The model well represents some of the animal's peculiar anatomical features, the most striking of which is the "rostrum," a paddle-shaped affair, richly supplied with blood-vessels and nerves, which projects forward from above the mouth and is probably used to feel about on the sea-bottom for prey. The long tapering body with extremely powerful tail indicates an adaptation for great speed. In life the shark is somewhat translucent and presents a peculiarly ghost-like appearance as it darts through the water. The alcoholic specimen from which the model was made is in the Museum collection and has been constituted the type of a new species (*Scapanorhynchus jordani*) recently described in the Museum "Bulletin" by Dr. L. Hussakof. The model was prepared by Mr. Dwight Franklin, under the direction of Mr. R. W. Miner, and is four feet five inches long.

DR. L. HUSSAKOF, Assistant Curator of Fossil Fishes, went to Europe in April to make a study of the ichthyological collections of the leading museums. The last few weeks of his stay will be spent at the zoölogical station at Naples.

NEWS FROM THE MUSEUM'S ARCTIC EXPLORERS.

EARLY in April letters written the middle of October were received with news from the Museum's Arctic Alaska expedition. The letters come from Flaxman Island, situated in the Arctic Ocean off the northern coast of Alaska and about midway between Mackenzie Bay and Point Barrow, and record the union of Mr. Stefánsson and Dr. Anderson, who followed different routes after leaving Herschel Island in August.

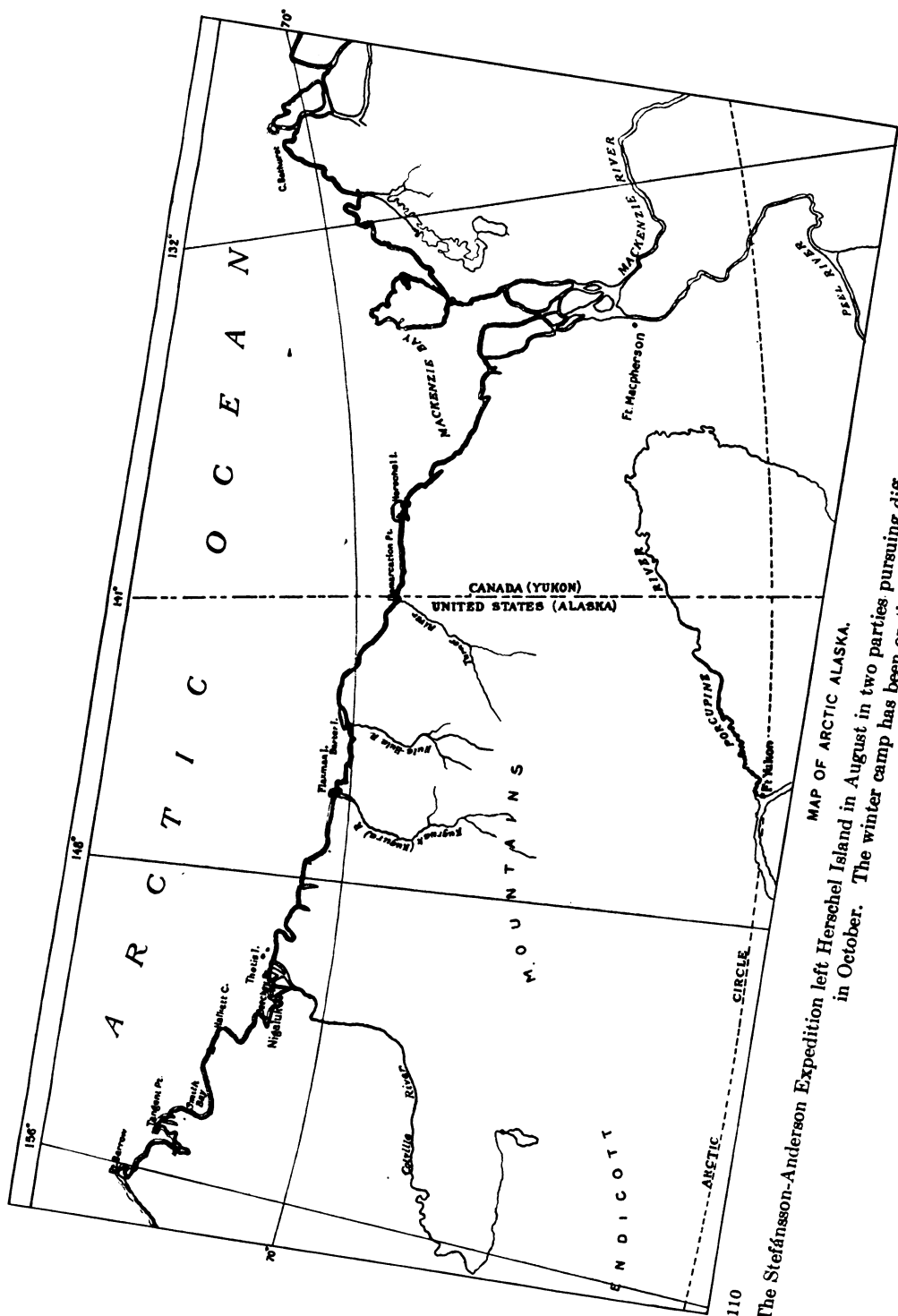
The route taken by Mr. Stefánsson was in part shown in the November, 1908, *JOURNAL*, and later facts were given in the March, 1909, number quoted from a letter written late last September. The expedition proceeded westward as far as Point Barrow; then on a return trip toward Flaxman was frozen in at Smith Bay, west of Cape Halkett, cached goods there, made a sled and continued slowly eastward. Dr. Anderson and his party cruised along the coast westward from Herschel Island until September 6, when their whaleboat was frozen in west of Barter Island and the men with their seventeen dogs had to proceed with sleds, feeding "on the country."

It is a satisfaction to know of the well-being of all members of this polar expedition up to October 19, 1908, when the Arctic winter was well started, and this feeling is intensified by a message that has come since the letters arrived. A telegram received by way of Seattle April 8, which was dispatched from Nome, Alaska, on April 6 and was originally dated at Point Barrow February 14, reads as follows: "Telegram of December fourth received. Well. Winter camp lower Colville. Game scarce. Nobody starving. Plans unchanged. Expect meet Whalers Baillie [Island]. Stefánsson."

Realistic accounts of the happenings of the weeks en route to Flaxman Island are given in the following quotations:

FLAXMAN ISLAND, ALASKA,
October 15, 1908.

***** We have made the trip from the delta of an unnamed river about 50 miles east from Point Barrow eastward to Flaxman Island, starting Friday, September 18, and arriving here Monday, October 12. Our trip was unusually slow for several reasons. I delayed some three days to visit



MAP OF ARCTIC ALASKA.
The Stefánson-Anderson Expedition left Herschel Island in August in two parties pursuing different routes to meet at Flaxman Island in October. The winter camp has been on the lower Colville.

the Schooner "Olga" beset in the ice off Cape Halkett as a letter from there has already informed you;¹ we lost about five days at various rivers, either through waiting for them to freeze over or in taking stuff across their deltas in half-loads; we employed about five days in hunting, skinning and caching (on high wooden platforms) seal and deer. We got one seal and twelve deer. Of the deer, I saved five specimens for Dr. Anderson. Three of these were killed in the Colville delta, and two a little east of it — three fine bucks, one old female, one young female (female and young with horns in velvet). The deer show different stages of pelage — an old buck was in summer color still, while the doe was fully changed and the others ranged between. We also secured some specimens of mice, weasels and birds.

At Flaxman Island we found Dr. Anderson and the three natives, all well and Dr. Anderson reasonably satisfied with the fall months, though he had had a rather complete change from whitemen's diet and had been compelled at one time to eat up his mouse bait (5 lbs. of rolled oats). His party had lived on squirrels and seal oil for a time, and later, on deer, fish and grouse.

Off Point Tangent I put some of our supplies and some we were carrying for Leffingwell aboard the schooner "Rosie H.", whose captain, Fritz Wolki, promised to take Leffingwell's stuff to Flaxman and mine as far as he could go. He was frozen in here, so we have here the following stores: 27 sacks flour, 100 lbs. triscuit, 60 lbs. pilot bread, 80 lbs. bacon, 20 gallons coal oil, 4 tanks alcohol; this besides some of our ammunition, which we brought from the east.

These stores are, of course, by no means sufficient for our maintenance, nor are they, even if taken with our stuff in Smith Bay, where our boats were frozen in. We shall, therefore, leave here as soon as Dr. Anderson and I get our letters written — probably next Monday — and go looking for game. Dr. Anderson wants to try getting some specimens of sheep, so he with two natives will go to the mountains by way of the Kugruak (on maps "Kugura") River, while the rest of us go west to near Beechey Point. Here we already have 8 deer cached and hope to get more, while some of us will try to get seal outside the Thetis Islands, which are off shore just east of the Colville. If threatened with starvation, Dr. Anderson will come back to Flaxman and get the flour from the "Rosie H.", while if we fail to get game, we shall go westward to Smith Bay where our boats are. Just now we are getting some seal here at Flaxman — from one to three per day — but it is our opinion that these will not last, for the floe ice is very heavy off shore and all open places will soon freeze. Most of even those natives who habitually

¹ Published in this JOURNAL for March, 1909, p. 67.

live at Flaxman are going elsewhere for the winter. Our special anxiety is for the dogs, I now have eleven and our natives twelve more, inclusive of three pups. If the dogs should die, we should be severely handicapped for next year.

I should have liked to go to Herschel Island now and up to Ft. Macpherson (a two months' round trip) to meet the winter mail and reply to any letters you may send by it, but as Capt. Wolki will gladly carry our letters to Herschel and as this is the best season to accumulate a little game and fish (before the sun leaves us), I have decided not to pay attention to anything but the problem of making a living.

If we can subsist near the Colville, as we shall try to do, we shall incidentally see a good many of the Colville people probably; if things go exceedingly well, I may even be able to get far enough inland to see most of them. When the days get long I want to make a trip to Baillie Island [off Cape Bathurst] and with open water I expect to visit the Colville people when they gather for trade at the delta village of Nirglik [Nigaluk, on the map], while we shall also probably be able to do the much-desired digging on Pingok (the big island off Beechey Point). These are the hopes and plans for the spring.

It is the intention of Captain Wolki of the "Rosie H." to winter in Banks Land next year. He says he will take us and our gear down there and (weather permitting) will land us where he lands, or elsewhere if we desire. He will wait some time for some of his own incoming supplies at Baillie Island, and will take aboard there anything we have for transportation. We shall therefore gradually take our stuff to his ship this winter and either precede or follow him with our boats to Baillie Island — according to the season and circumstances. Then we shall go to Banks Land, or elsewhere, as seems best. From information secured by natives who were with Captain Mogg in Victoria Land last year, we now know there are people on Banks Land, though none have ever been seen there either by the early English explorers or by whalers coasting along the west shore.

A second letter written by Mr. Stefánsson two days later considers their need of ammunition and like supplies, and closes with the reassuring sentence: "You have, of course, no reason to worry about us; we are pretty well off."

Many interesting facts concerning the zoölogical work of the expedition are given in a letter from Dr. Anderson under date of October 14; while definite information as to plans for the immediate future are stated not only in the letter proper, but also in a postscript under date of October 19.

FLAXMAN ISLAND, ARCTIC OCEAN, ALASKA,
October 14, 1908.

***** I started west with three natives in a whale-boat and a large skin canoe or umiak about 25 feet long, with the intention of cruising along the coast to Flaxman Island to meet Stefánsson early in September. We had seventeen dogs and ourselves to feed "on the country," as we started with about one sack of flour, four or five pounds of bacon, a little tea and coffee and about fifty pounds of dried fish. We had several gill nets and were obliged to stop and fish a good deal at various places. Fishing was only fairly good along the coast; we caught from ten to forty whitefish nearly every day and a few salmon trout, but could not get very many ahead.

We saw seven caribou and killed one August 18, at Demarcation Point, the international boundary. Our whaleboat was frozen in at a reef a little west of Barter Island, Alaska, on September 5, about fifteen days earlier than usually happens. We succeeded in drawing it up to an apparently safe place on the reef by means of block and tackle which we had with us, cached one chest of specimens and part of our goods with the boat and broke ice and dragged the skin boat over the sandbars to the mainland at the mouth of Okpilak River, taking part of our supplies with us.

We killed a good many squirrels here (*Spermophilus parryi*) which helped out our commissariat and made a few "skins" also. As we had only two or three days' provisions on hand, and as the ice was too thin for sled travel, we made pack saddles for several of our dogs, and started September 9 across the half-frozen tundra to the place where the Hula Hula River emerges from the mountains, and the swift water remains open much later than near the coast. The lower coast of both the Okpilak and Hula Hula froze over at the time the "young ice" formed in the sea lagoon. Snow fell on September 10 and has remained on the ground ever since.

At the fishing place on the Hula-Hula River we caught several hundred salmon trout (two species), many specimens being from six to eight pounds in weight. One day we caught 284. We also killed three caribou on September 14, but my native inconsiderately ripped the hides off and ruined them for specimens while I was chasing the fourth individual of the herd. We remained up-country over two weeks, returned to the coast for our two sleds, hauled the fish and meat back to our camp on the coast, and started as soon as possible for Flaxman Island, the sleds pretty heavily loaded with most of our fish and meat. We arrived at Flaxman Island October 4, after a rather hard trip along the coast, owing to rough frozen in blocks of ice in places and salt slush in others.

We had seen only one family of natives camped at Barter Island and two sailing in a whale boat late in August, and they had told us that Leffingwell

had left Flaxman Island and nobody was there now, as the natives were hunting in the mountains. Hence we did not know what we should have to do on arriving there, as it seemed probable that Stefánsson had been frozen in also. On arriving at Flaxman Island, we found the whaler "Rosie H." of San Francisco frozen in and wintering here. Captain Fritz Wolki reported that he had passed Stefánsson and Storkerson in Smith Bay with a sloop and a whaleboat * * * *.

Our flour, bacon and all "civilized foods" had been exhausted by August 30, the coffee very soon afterward, and from that time until we reached Flaxman, October 4, we were strictly on a meat and fish diet. We succeeded in pulling through without going hungry at any time, but a man misses the bread after a few weeks.

***** In sending out part of our supplies from New York, I think it would be desirable and economical to send at least part of the lighter materials packed in substantial tin-lined chests which could be used for packing and transporting specimens in the North. The three collecting chests that I took out with me are filled with specimens (bird and mammal skins) and cached, one at Herschel Island and two near Barter Island, and I shall try to send the specimens out next summer. If I get no more chests, I shall have to send out these small skins in what wooden packing boxes I can find or patch together, and take chances of having them damaged by rats, mice or dampness in a long whaling voyage before reaching San Francisco.

***** If the natives know that a man wants rare or unusual specimens, they often bring them in, and expect a present of some kind, or at least the ordinary fur trader's prices. For example, there is a species of badger found near the mountains a few miles from this coast, rather rarely, and what few the natives bring in are sold for about one dollar apiece. We may or may not be able to catch a specimen ourselves next spring. I have seen a native fur coat made of badger skins, and the fur is much denser and softer than the southern badger, which appears to reach its northern limit on the Athabasca River, around Pelican Rapids.

It is probable that we shall pass most of the winter and spring in the neighborhood of Smith Bay, near our "grub pile," spending part of the time a little farther east around the mouth of the Colville River.

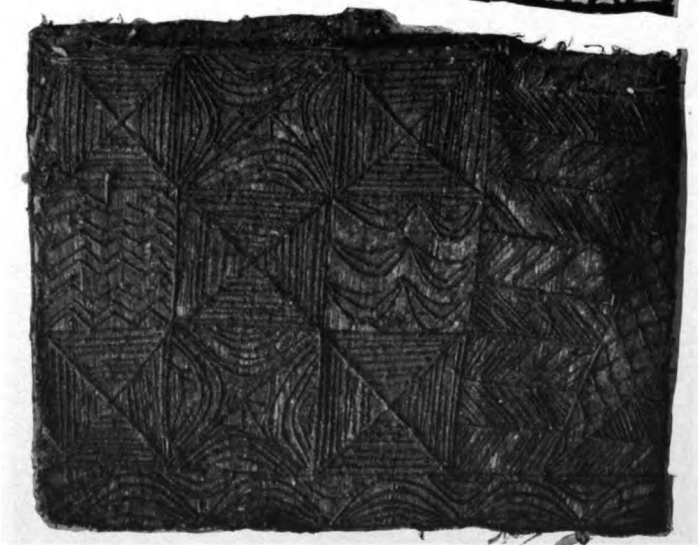
Stefánsson will probably start west very soon, while I go into the mountains near here with one of our natives, up either the Hula-Hula or Kugura River, and try to get some mountain sheep before the snow gets too deep. This part of the Endicott Range is said to be the best mountain sheep country left in Alaska, and the natives kill a good many at all seasons of the year. We met one native near Barter Island in August, who had just returned from the mountains, after killing twenty sheep. The caribou are

killed in considerable numbers all along this coast and are said to be working westward in greater numbers every year to the Colville River region and up towards Point Barrow. The natives say that the deer here are smaller than those east of the Mackenzie River. I have a very dark August specimen taken at Demarcation Point, on the Canadian side, Yukon Territory. I have a fair series of the two species of ptarmigan found here, all in the mottled transition plumage, a few small mammals, including a peculiar shrew from the Hula-Hula (at least different from any I have seen before). I made a good many bird skins along the coast in August and September.

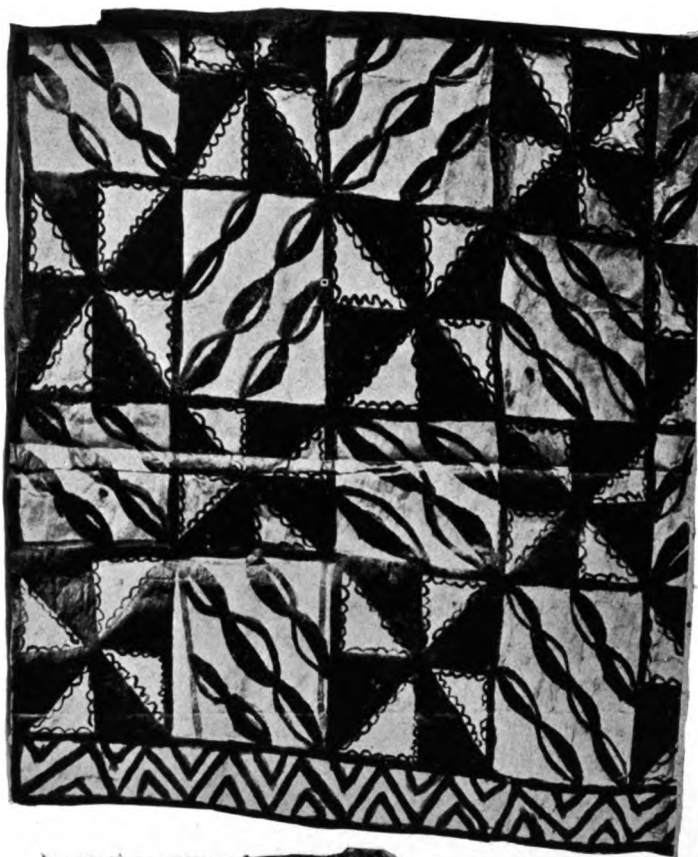
Captain Wolki of the "Rosie H." is something of an ornithologist, and has collected bird skins and eggs in the Arctic Ocean for many years.*** He knows the species very well and is apparently a very close observer. He has a house on the Horton River, Franklin Bay, east of Baillie Island, where he lived and traded for four years. He says he has a collection of skins there now, including among others pomarine and long-tailed jaegers, golden eagle, hawks, and gulls. He has taken great numbers of eggs of the snow geese there, also whistling swan, American white-fronted goose, and black brant, in fact, nearly all the northern species except Ross's snow goose and yellow-billed loon. He says he saw one white pelican at the mouth of Mackenzie River and six spoonbill ducks taken at Horton River, both species being unknown to the natives. The Eskimo, by the way, distinguish between the different species better than most white men, and have names for nearly all the species.

October 19. Mr. Stefánsson left for the west to night with Billy Akpek and his wife and expects to spend some time deer-hunting around the Colville. I shall start east to-morrow with Ilavinerk and his wife in company with Capt. Wolki's outfit, bound for Herschel Island. We shall ascend the Hula-Hula River just west of Barter Island for a few weeks hunting for mountain sheep, together with any other specimens we can get in the mountains. We shall stay until we get a good series of specimens, or get starved out, then retreat to Flaxman Island and go westward from there.

PRESIDENT HENRY F. OSBORN will attend the Darwin Memorial celebration at Cambridge University, England, June 22-24, as the delegate of the American Philosophical Society. Director H. C. Bumpus will attend the same celebration as the delegate of the Museum and then will go to Geneva, Switzerland, to represent the New York Academy of Sciences at the 350th anniversary, July 7-10, of the founding of the university there.



116 STENCIL PATTERN.



FIJIAN CLOTH.

The Fijians make "tapa", their native cloth, from the inner bark of paper mulberry, rubbing with dye over a stencil to give it a pattern.

THE FIJIAN COLLECTION.

THE Museum has recently secured, as a gift from Mrs. Morris K. Jesup, a valuable collection from the South Seas. This accession, containing more than two thousand specimens, comes largely from the Fiji Islands and amply represents most features of the culture of the native inhabitants.

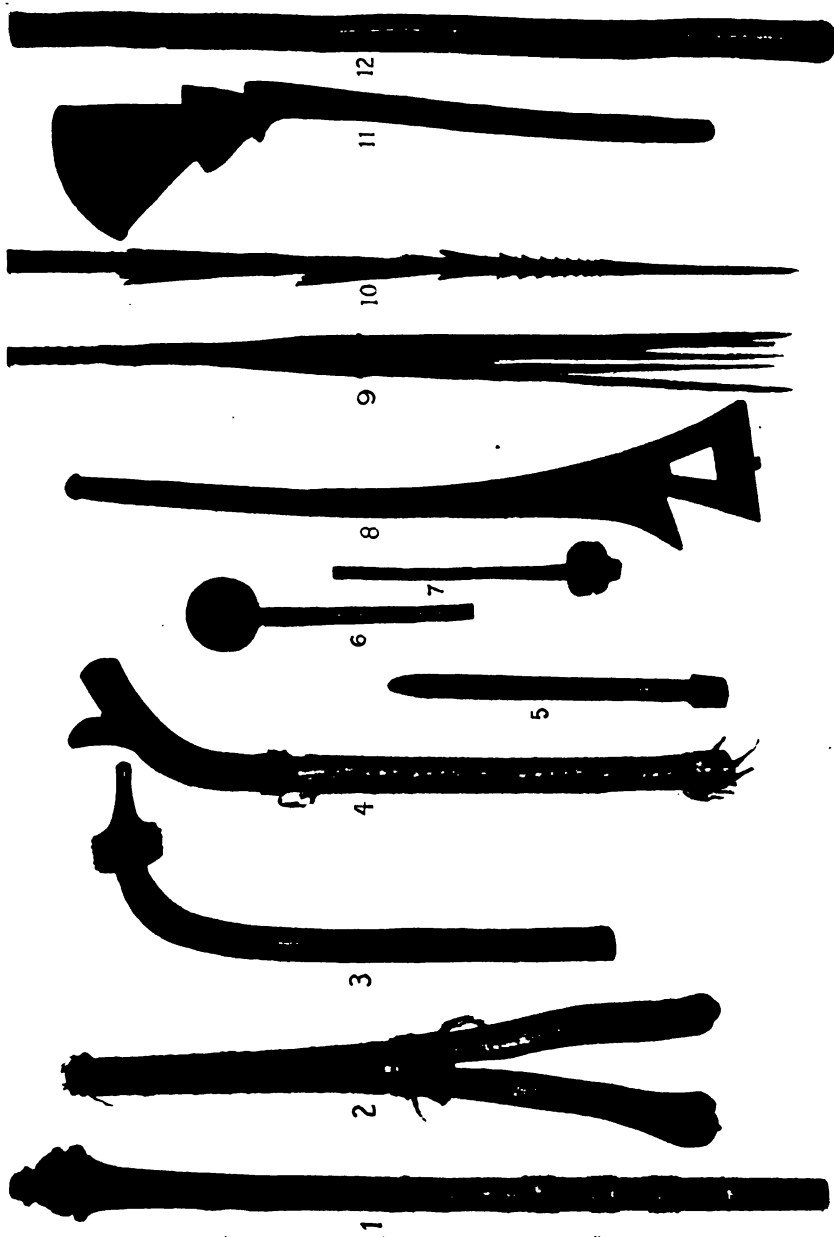
The Fijians, while resembling the Melanesians in physique, speak a language related to that of the Polynesians; also they share many cultural traits with the Polynesian inhabitants of Tonga and Samoa, with whom they have been in intimate contact for a long period. For instance, like their eastern neighbors, the Fijians drink kava, a stupefying beverage prepared from the roots of the plant *Piper methysticum*; and the new collection contains an imposing array of the bowls used in the process of kava making. Both preparation and drinking are accompanied by a great deal of ceremony. Young men, in public assembly, chew portions of the roots, then deposit them in the bowl, which is afterwards filled with water. Next a special official is entrusted with the task of straining the liquid, while hundreds of spectators watch his movements, imitate his postures and join in a choral chant. When the kava is ready for use, a prayer is recited by a herald, and the king, after pouring out a libation, drinks from a cup made from the half of a cocoanut. To be served after the sovereign is a great honor usually awarded for some distinguished personal service. A curious custom connected with the kava ceremony is the voicing of a toast after each draught. The drinker may express a wish for favorable winds, for plenty of fish or an abundant crop, or may set forth some other hope depending on his profession. Frequently, this ceremony is followed by a feast of yams, taro, figs and nuts.

One of the most notable achievements of the South Sea aborigines is the ornamentation of their tapa or native cloth, and here again the collection furnishes interesting evidence of both material and method. Tapa is manufactured from the inner bark of the paper mulberry, strips of which are beaten with a mallet and joined together with arrow-root paste to make the necessary size. Pattern-boards or stencils are constructed from large palm leaves, the designs consisting of coarse fibers or twigs sewed on to the leaf foundation. The cloth is placed over the stencil and rubbed with a dye until the pattern of the orna-

mentation is transferred. Fijian specimens, both of the finished product and of the stencils employed in its decoration, are shown in the illustration on page 116.

Other objects typical of the South Sea area generally, such as adzes, fly switches and tattooing implements are also adequately represented in the collection. There are numerous throwing-clubs, short sticks terminating in a knob, formerly carried in the girdle and used as the instrument of assassination. The collection contains a very large series of clubs of varying shape; some are obviously recent productions fashioned in imitation of guns. Many of these weapons have a carved decoration, which usually takes the form of a zigzag pattern of some kind. Part of them are wrapped with cordage, others with a checker plaiting. A weapon differentiating the Fijians from their eastern neighbors is the bow, which occurs in Polynesia merely in the form of a toy. A small assortment of Fiji earthenware (page 121) is of considerable interest, as all of the Polynesian tribes lack pottery and are obliged to prepare their food by baking or roasting.

One of the most valuable specimens is the model of a bure, or temple. This building was usually erected on a platform or mound, rendered accessible by a notched plank. From this eminence the bure rose to the height of about thirty feet. As nails were entirely unknown to the Fijians prior to European contact, they fastened together the posts and rafters by means of sinnet, the native cordage, prepared from the dried fibers of the cocoanut husk. In the construction of a temple, an immense quantity of sinnet was used for decorative purposes, so that from a distance the whole house seemed to be built of braided cord. Before lowering the corner posts into their holes, the Fijians offered human sacrifices to propitiate the deity of the temple; sometimes men were placed standing in each post hole and buried alive by the side of the post. The setting up of the first pair of rafters was solemnized with a cannibal feast, and a similar celebration took place as soon as the building was completed. The human bodies were baked in ovens. The forks or dishes used in eating human flesh were strictly "taboo," that is they were religiously reserved for this purpose under penalty of death. The Museum collection contains several of these cannibal forks and flesh-racks (page 121). Although serving as a council-chamber, a place for entertaining friendly visitors, and even as a sleeping-place for the most eminent residents of the village, the principal function of the



FIJIAN CLUBS AND SPEARS.

1 to 5, and 12 — Various types of clubs. 6-7 — Throwing clubs. 8 and 11 — Gun clubs. 9-10 — Spears.



MODEL OF BURE OR TEMPLE.

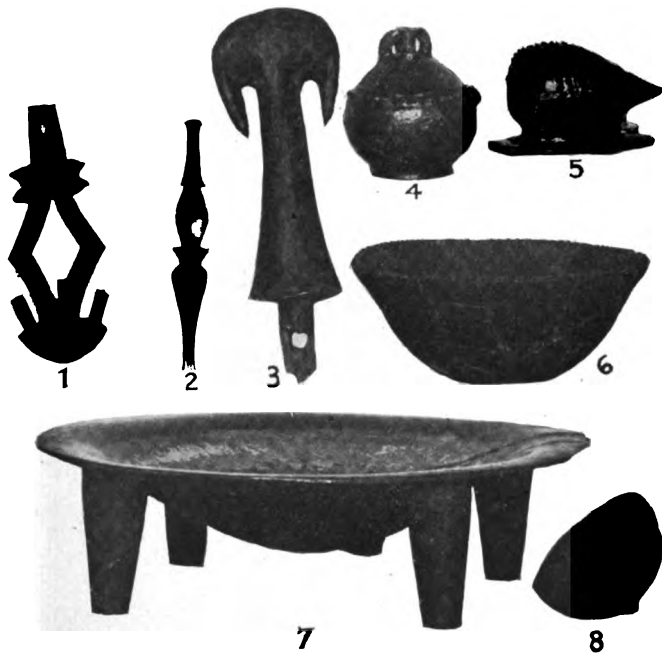
Nails being unknown, cordage was used to fasten together posts and rafters.

bure was for religious ceremonies. Here votive offerings of food and whale's teeth were presented to the deity. Here also the native priest fell into a trance, during which he held communion with supernatural powers, whose decision on the question at issue was afterwards announced to the populace.

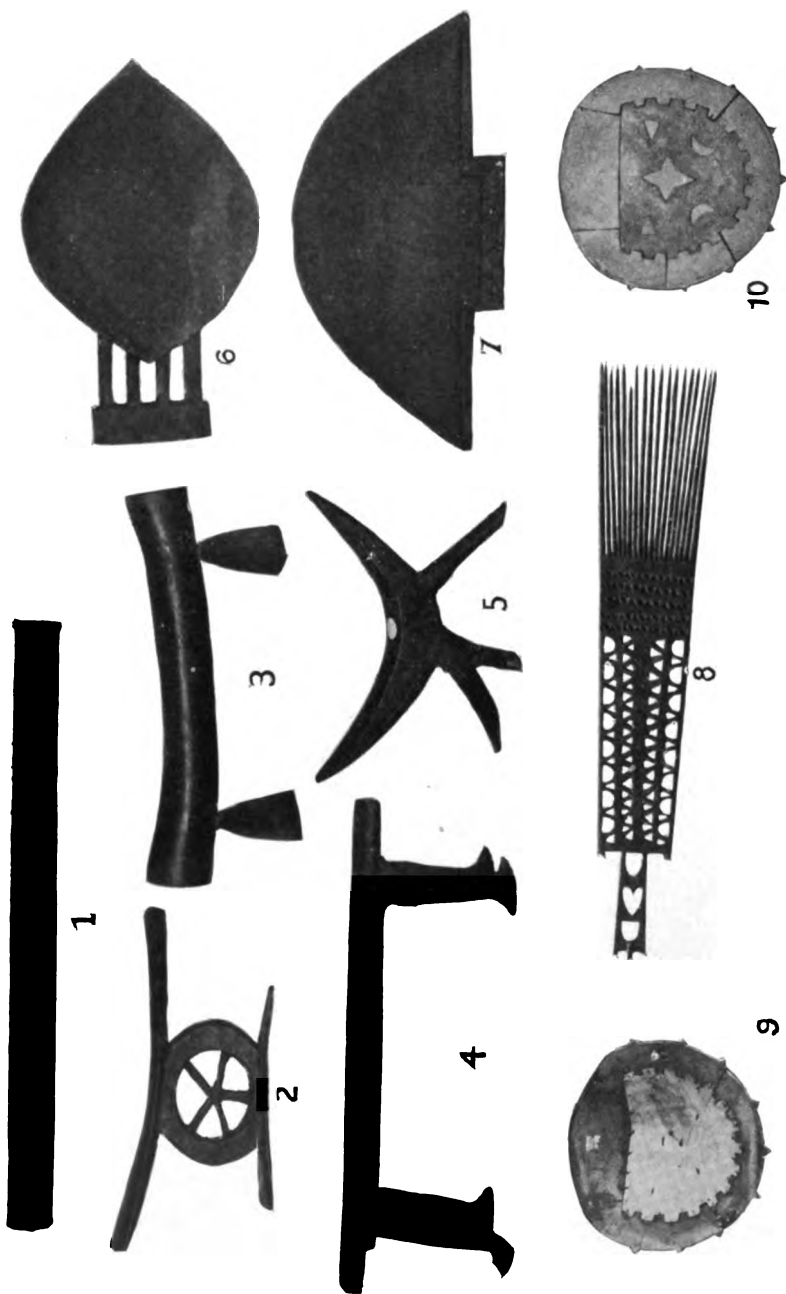
While the temple illustrated the architectural skill of the Fijians, which is superior to that of all other Oceanians excepting the Maori of New Zealand, their craftsmanship in other directions is shown by the variety of their neck-rests and the attractive open-work decoration of their combs. (See plate on page 122.) Oil and food dishes of wood are of rather crude execution, but interesting in shape. Very artistic effects are produced in the breast-plates of shell bone, which are tastefully decorated with inlaid patterns.

The objects illustrated here and other material selected from the collection have been installed temporarily in a wall case in the northeast corner of the Siberian Hall (No. 101) on the ground floor.

ROBERT H. LOWIE.



CANNIBAL FLESH HANGERS (1 AND 3), CANNIBAL FORK (2), FIJIAN POTTERY (4 TO 6), KAVA BOWL AND CUPS (7 AND 8).



DR. WILLIAM JONES.

IT is our sad duty to record the death of Dr. William Jones, a distinguished ethnologist who for several years was connected with this Museum, but who for some months had been on a collecting expedition for the Field Museum of Natural History, Chicago, among the less civilized tribes of the Philippine Islands. While near Monbato, Luzon, he was attacked by a party of savages on March 28, his thirty-sixth birthday, receiving wounds from which he died on the same day. This is truly a great loss to ethnology, since Dr. Jones was well equipped for work among the Algonkin Indian tribes of North America and had at the time of his death a wealth of unfinished work, most of which is now beyond recovery.

His college career began as a student at Harvard where he received the A. B. degree in 1900. Then he took up the study of anthropology at Columbia University, where he received the degree of Doctor of Philosophy in 1904. He was University Fellow 1900-1902 and Assistant in Anthropology 1902-1903. From 1904-1906 he was a Research Assistant for the Carnegie Institution. While at Columbia University, Dr. Jones made several expeditions for this Museum, returning with collections and data from the Ojibway, Sauk and Fox Indians. These collections are quite complete, those from the various divisions of the Ojibway containing a large series of birch bark charts and song records used in religious societies peculiar to these and related tribes. His chief work, however, was a study of the various Algonkin dialects spoken by the Ojibway, Fox and Kickapoo. Born of a mixed blood Sauk mother and reared by his maternal grandmother, he acquired one Algonkin dialect and gained an insight into Indian life not otherwise easily obtained. His published works include a volume of myths under the title, "Fox Texts," issued by the American Ethnological Society; a general discussion of Ojibway culture, published by the Department of Education, Toronto, Ont.; and "The Algonkin Manitou," in the *Journal of American Folk-Lore*. As these represented but a small part of the data collected by him, now buried in his notes, it is no adequate measure of his work. He had a knowledge and grasp of the ethnological problems centering around the central Algonkin tribes, all his own, and it was his intention after a short journey to the Philippines, again to take up the Algonkin problem as his life work.

Aside from scientific worth and attainments, Dr. Jones had a character and personality that endeared him to many in all walks of life. He was unassuming and modest, yet withal sincere and governed by a high sense of honor and duty. He had a rare sense of balance and proportion that enabled him to meet with sympathy every upright man on his own horizon. Perhaps this is why he had so many friends in such varied walks of life.

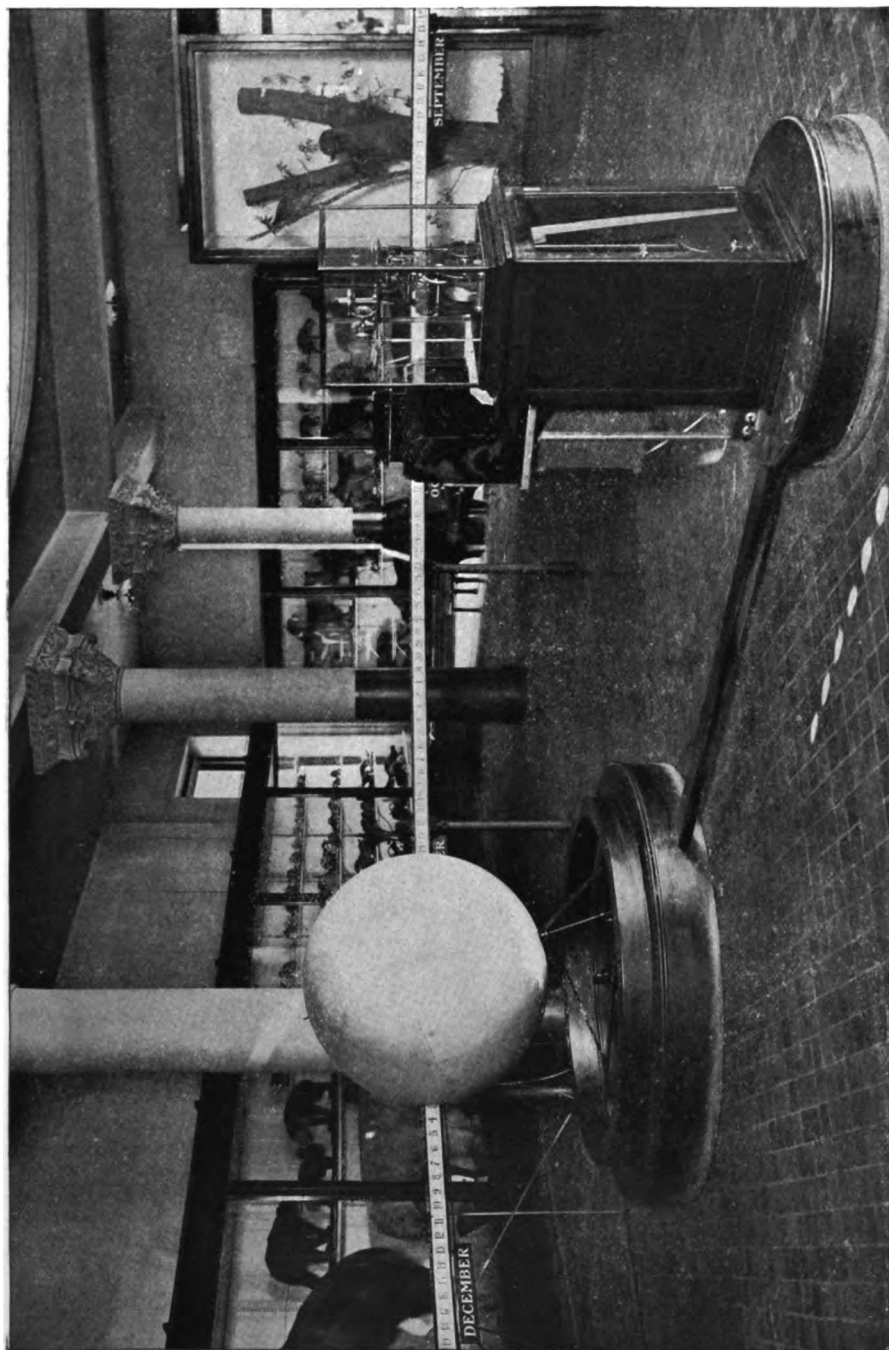
CLARK WISSLER.

THE EARTH AND THE SUN.

AN exhibit making clear the cause of day and night, of the differences of local time and of the succession of the seasons is shown in the accompanying photograph. A four-foot globe, standing for the earth, is regulated to rotate on its axis and to revolve in its orbit around the sun. The circular railing inclosing the exhibit and conspicuously marked with the months and days of the year indicates the orbit; a strong beam from an electric stereopticon represents the light and heat from the sun.

When the visitor approaches this exhibit, he sees no motion except the regular swinging of the pendulum of the clock-work that causes the globe's rotation. A short period of watching, however, convinces him that the globe is moving with the passage of the minutes to bring places most directly in the rays of the sun into the full light of noon time, regions west of these into morning hours, regions east toward the time for the "setting of the sun." The shadow of a line (in front of the lens of the stereopticon) is cast on the globe from pole to pole to mark the noon hour for the different localities, as one after another, from east to west, they reach and pass it; while the time for New York City is recorded continually, as the fifteen-minute sub-divisions on the equator of the globe approach and leave behind this same line shadow.

The location of the earth in its orbit at any day of the year and the inclination of the earth's axis are represented as they occur in the heavens. This exhibit differs from that of the Solar System in the Foyer in that little attention is given to proportional distances and dimensions. It is located, at present, in the Central Hall of the Second Floor, awaiting the construction of a Hall of Cosmology.



THE PHILIPPINE EXHIBITION.

THE Philippine Hall is dismantled and the Philippine Exhibit prepared at the request of the United States War Department, has disappeared from the Museum to reappear in Seattle on the opening day of the Alaska-Yukon-Pacific Exposition. There, given the same form that it had here, the same unity of idea, the same harmony of color and decorative effects, it will remain in the Philippine Building of the Exposition from June 1 until October 16, after which it will return to be given permanent installation in the Museum.

It is but little more than ten years ago that the Filipinos were in insurrection against Spanish rule. They had known nothing of freedom for nearly four hundred years, while this period of paternal government had civilized them and made them feel equipped for freedom. Not only had they no voice in the government, they had practically as little control over Philippine trade. Their tobacco industry was a State monopoly; their foreign commerce catered to Spanish interests and the merchants of Seville. As to education, there was but one teacher to every four thousand of population. The Filipinos had not even a medium of communication with Spanish authority, for the agents of the church in whose hands rested the management of schools, had kept the Spanish language out of the curriculum in order to retain their power as intermediaries between the people and the government.

Then came American occupation in December, 1898; and, despite the best efforts of the American government, the story of the Filipinos in the years immediately following remained in many respects a sorry one. With lack of understanding of English, with no knowledge of America as a conquering nation, it was difficult indeed for even the most enlightened of the tribes to look upon the American military governor and the American army as friends instead of enemies. Guerilla warfare was added to the ravages of the previous war and continued until 1902. Rice fields were left to cogon grass and weeds; robber bands multiplied. In addition, typhoons damaged the hemp plantations; the locust plague destroyed crops; a "rinderpest" killed off the draft cattle; while cholera and various tropical diseases brought dread results to the Filipinos themselves.

Slowly out of the blackness of these years came trust in the American government and a radical change in conditions. Children and teachers





alike were glad to be taught English by the soldiers, who entered the schools at once and carried on the work until the arrival of one thousand teachers from the United States in 1900. The Filipinos also found themselves in possession of a share in the government, not only in the cities and provinces where two-thirds of the officials were elected by the people's vote, but also in the central government, three Filipinos and four Americans comprising the Philippine Commission. They gained practical ideas at the government experimental farms where they flocked in hundreds to see modern machinery and methods applied to the growing of Philippine crops. Each man learned that he could cut lumber free of charge from the public forests to build a substantial house and a boat. Many hundreds of Filipinos gained work and good wages in the construction of the new roads and railroads. Many an inland farmer found routes opened by which he could market his produce. The lepers and their friends realized that the homes provided at the Culion Island Leper Colony were better than any they had ever known. Prisoners from Manila appreciated the fact that they were made "colonists" on parole at Iwahig, with opportunity to work in the fields and earn the privilege of being joined by their families.

When these facts are borne in mind, the Philippine Exhibit assumes new interest. It shows not only what the Filipinos were, and what Philippine agriculture and commerce were, under Spanish rule, but also what they are under American influence. It proclaims emphatically that progress has been the keynote of life in the Philippines in these ten years, despite calamities, and it suggests that in the future the prosperity of the Philippine people is to be limited only by the great productive capacity of the islands.

The first section of the exhibit shows Negrito and Igorot huts with accompanying life-size figures represented in the work of making fire, carrying baskets of food, cleaning rice and weaving. The second section leads from these most primitive tribes through the Moro and other lesser tribes to the Tagalog and Visayan groups, the most highly civilized of the Malayan Christian Filipinos. The cases are filled with metal work, with pottery and basketry and with beautiful cloths woven from hemp, pineapple fibre and silk; the pillars carry weapons of many kinds, fishing and hunting outfits, busts of natives, and relief maps showing the localities occupied in the islands by each tribe.

Continually, however, the attention of the visitor is caught by the

colored transparencies that surround the entire hall in a bamboo trellis above the cases and some distance from the walls. The method here used of closely incorporating transparencies with the material part of an exhibit is an innovation in museum installation and a most effective one, not only for the accurate telling of facts but in general artistic result as well. In perhaps no other way could the Filipino people and their activities have been made so vivid; but the pictures do more than bring the people definitely before the eye, they give to a certain extent the atmosphere of the islands; they show the beauty of Philippine forests and rivers, the picturesqueness of the rice terraces that cover the mountain slopes, the difficulties of the mountain trails, and the sweep of typhoons over palms and sea.

There are many other decorative effects which also tend to give unity and meaning to the exhibition. Fish nets and hemp fibre connect the pillars to shut off a middle aisle, an open space except for seats constructed of Philippine woods and bamboo and of the stocks formerly in use in the market places of Manila. At the center of the hall a rotunda is made of large Philippine palm trunks around which are stacked Filipino guns, surrendered during that six months after President McKinley's reelection in 1900 when more men gave up their guns in the islands than during any similar period in the history of war. Swung conspicuously in the center of this rotunda is one of the most charming features of the exhibit, a strange outrigger boat so typical of the small craft in the far east, containing a Moro youth, paddle in hand.

The third and fourth sections of the exhibit illustrate the Philippines under American influence, the former covering agricultural and commercial life, the latter, educational and political. Here it is that such significant facts as the following are concretely set forth:

Philippine coal promises to be sufficient in the future for the needs of the islands.

Philippine forests contain 665 kinds of trees and cover 48,112,920 acres. This fact is emphasized by a wainscoting of Philippine woods surrounding the entire exhibition hall, representing the largest and most authoritative collection in the world.

There were 428 miles of standard gauge railroad in operation at the close of 1908, and four years more will give the islands a total of 1000 miles, whereas only about 120 miles of narrow gauge track existed at the close of Spanish rule.

Under the Americans 3506 primary schools have been opened, which number added to the 726 existing in Spanish times gives a total of 4,232 at present in the islands.

The cultivation of rice has latterly increased to such an extent that in 1907 there had to be brought into the islands from foreign countries only about one-third of the amount imported in 1903.

The Philippines are a commercial center for half the population of the globe. The total amount of produce sent out from the islands in 1907 was \$33,097,867, and the total amount imported was \$30,453,810, as compared respectively with \$14,846,582 and \$19,192,986 in 1899.

The most important fact developed in the Philippine Exhibit, outside of the increased prosperity of the islands, is that under American influence the Filipinos are eagerly taking the steps offered toward self-government and self support: that there is administration of justice in the islands and the people are engaged in peaceful pursuits, that the United States is not expending any money to assist the Philippine government or the Filipinos except in so far as the appropriations for Army and Navy are in part expended in the islands.

One other fact, however, is certain to stand out clearly before every thinking visitor to the Philippine Building at Seattle, which is, that the American record in the Philippines is one of which the world will be proud, when this record takes its place in the history of nations.

MUSEUM NEWS NOTES.

SINCE the last issue of the JOURNAL the following persons have been elected members of the Museum: Life Members, MESSRS. FREDERICK T. VAN BEUREN, KARL HUTTER, NATHANIEL T. KIDDER, CHARLES B. PENROSE and GEORGE D. PRATT; MMES. OLIVER G. JENNINGS, JOHN INNES KANE and SAMUEL LAWRENCE, and MISSES P. C. SWORDS and ANNE THOMSON; Annual Members, MESSRS. J. R. BRADLEY, CHAS. W. BURROUGHS, LOUIS C. CLARK, WM. CRAWFORD, ROBT. H. ENGLE, HENRY P. FAIRBANKS, GEORGE R. FEARING, HARRY L. FERGUSON, ARNOLD HAGUE, H. H. HOLLISTER, MARC KLAU, ALFRED G. MAYER, HENRY METCALFE, CASIMIR DE R. MOORE, WILLIAM E. NICHOLS, GEORGE E. POLLOCK, THOMAS R. PROCTOR, H. CASIMIR DE RHAM, A. W. ROSSITER, THOS. ROWLAND, CHARLES W. SABIN, HENRY

W. SHOEMAKER, F. M. SMITH, HOWARD VAN SINDEREN, FREDERICK C. WALCOTT, HORATIO WALKER and WILFRED J. WORCESTER; MMES. W. RATHBONE BACON, OLIVER H. P. BELMONT, M. M. VAN BEUREN, SAMUEL P. BLAGDEN, NATHALIE BONNER, P. H. BUTLER, LILIAN GILLETTE COOK, CLARENCE W. DOLAN, THOMAS EWING, JR., OGDEN H. HAMMOND, H. M. HARRIMAN, J. C. HAVEMEYER, G. G. HAVEN, RICHARD MARCH HOE, H. K. KNAPP, LEWIS CASS LEDYARD, PAUL MORTON, B. C. RIGGS, GEORGE M. TUTTLE and ANNA WOERISHOFFER, and MISSES MARY BENSON, MARGARET E. GALE, ALICE E. STRONG and EWERETTA C. WHITNEY.

PRESIDENT OSBORN has recently been elected one of the twenty-five foreign members of the Zoölogical Society of London and an Honorary Member of the Royal Academy of Sweden.

PROFESSOR H. E. CRAMPTON, Curator of Invertebrate Zoölogy leaves New York early in May for an absence of eight months on an expedition to the South Seas for the purpose of continuing his important studies on the variation and distribution of terrestrial snails, a work which he began in 1906 for this Museum and continued in 1907 and 1908 under a grant from the Carnegie Institution. Professor Crampton will devote most of his time to the Society Islands, the Cook Islands, the North Island of New Zealand, Samoa and Hawaii.

A RECENT letter from Mr. William B. Richardson, collecting for the Museum in Nicaragua, announces the shipment of a large collection of birds and mammals made during the last six months at points ranging in altitudes from 700 to 5,000 feet. Among the mammals are many species not included in his previous shipments.

DR. ALEXANDER PETRUNKEVITCH, Honorary Curator of Arachnida, will spend July and August collecting arachnida and other forms of insect life in Texas, Mexico and Guatemala.

PUBLIC meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum as usual during May.

The American Museum Journal

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Act of Congress, July 16, 1894.

The American Museum Journal

VOL. IX

OCTOBER, 1909

No. 6

THE ENRICHMENT OF OUR COLLECTIONS FROM ARCTIC AMERICA.

OUR members will be interested in the following telegrams which were exchanged immediately upon Commander Robert E. Peary's getting in touch again with the civilized world.

Indian Harbor via Cape Ray, N. F.
September 6, 1909.

AMERICAN MUSEUM OF NATURAL HISTORY, 77th Street
and Central Park West, New York City.

The Pole is ours. Am bringing large amount material for Museum.
PEARY.

New York City, September 7, 1909.

Commander ROBERT E. PEARY,
Steamer "Roosevelt,"
Sydney, Cape Breton, N. S.

American Museum profoundly moved. Am delighted with your triumph at last. Mrs. Jesup joins me in congratulations. Your flag and route posted on our polar map this morning.

OSBORN.

At the time that this number of the Journal goes to press the eminent explorer has not yet arrived in New York, and the material which is awaited with so much interest is still on its way to the city. Our late president, Mr. Jesup, was deeply interested in Mr. Peary's success, being an original member of the Peary Arctic Club and a generous contributor toward its objects. Largely through Mr. Jesup's interest and influence Mr. Peary and the Peary Arctic Club have provided the Museum from previous expeditions with much ethnological material illustrating the Eskimo of the Smith Sound region, including summer and winter clothing for men, women and children, personal ornaments, carvings, games and toys, lamps and other household utensils and furniture, sledges,

dogs and harness, bow drills for making fire and for boring, knives and other tools, bows and arrows and guns of European manufacture but native repair, kyaks or boats, together with drags, floats, harpoons, lances, spears and fishing lines. Some of this material together with a great floor map showing routes has been placed on exhibition on the ground floor of the new west wing. In the line of zoölogy, among other things Mr. Peary has brought back to the Museum important series of mammals, particularly musk oxen and caribou. The most valuable single specimens resulting from the Peary expeditions are the three iron meteorites from Cape York which were brought from the Arctic regions in 1897 and are now on exhibition in the Foyer. The largest of these weighs $36\frac{1}{2}$ tons and is known as "Ahnighito," the others are "The Woman" (6,000 pounds) and "The Dog" (897 pounds).

MUSEUM NEWS NOTES.

ON account of the part that the Museum is taking in the Hudson-Fulton Celebration, the current number of the JOURNAL is devoted to the special Guide Leaflet which has been prepared to accompany the exhibition pertaining to the Indians of Manhattan Island and vicinity installed at the west end of the Hall of the Plains Indians (No. 102 of the ground floor). This exhibition is permanent in character and is further illustrated by the volume on the Indians of New York State which has been prepared under Dr. Clark Wissler, Curator of Anthropology, as editor and issued by the Museum in its series of "Anthropological Papers." The Guide Leaflet in separate form may be obtained at the entrance to the Museum or on application to the librarian, and copies of the larger work may be obtained from the librarian.

THE cetacean gallery on the third floor of the East Wing (Hall No. 306) was opened again to the public early in September, after being closed for some months on account of changes which were in progress. A broad frieze representing the ocean now extends around the room and forms an appropriate background for the marine mammals which are its chief exhibits. At the west end of the hall is a series of models representing a school of dolphins at play in the water, while at the east end of

the hall a school of porpoises is similarly installed. The models were prepared at the Museum from casts, drawings and photographs of actual specimens, and the frieze was painted by Mr. Albert Operti. *

PRESIDENT OSBORN attended the Darwin Memorial exercises at Christ College, Cambridge, during the latter part of June and was the spokesman of the scientists and scientific institutions of America in giving to the University of Cambridge a replica of the Couper bust of Darwin that was donated to the Museum last February by the New York Academy of Sciences.

THE series of paintings illustrating the North Polar regions which has been made by the artist, Mr. F. A. Stokes, has been completed and forms the background of the entire Eskimo exhibit at the northern end of the north hall of the ground floor. These paintings will be made the subject of a special illustrated article in an early number of the JOURNAL.

PROFESSOR BASHFORD DEAN, Curator of Ichthyology and Herpetology, spent the months of June and July in Europe, where he visited the museums of Paris and London. Professor Dean has recently been made a Correspondent of the Natural History Museum of Paris.

A RESTORATION of the jaws of the great shark *Carcharodon angustidens* which inhabited the waters of the American Atlantic Ocean during Eocene Tertiary time has been prepared under the direction of Professor Dean and mounted at the entrance to the fossil fish alcove at the south-east corner of the fourth floor. This restoration, which is 8 feet, 10 inches across and has a spread of 5 feet, 8 inches, gives one a striking idea of the enormous size and fierce aspect which these ancient sharks must have possessed.

MR. R. C. ANDREWS of the Department of Mammalogy left New York on August 25 for Manila to join the U. S. Fish Commission ship "Albatross" for a cruise of eight or ten months in the Pacific Ocean, particularly among the islands along the western border from Borneo to central Japan. Mr. Andrews goes under an appointment by the U. S. Fish Commission.

PROFESSOR HENRY E. CRAMPTON, Curator of Invertebrate Zoölogy,

who is continuing his extensive studies on the variation and distribution of terrestrial snails in the islands of the south Pacific is now in Samoa, after spending ten weeks in the Society Islands and about a month in New Zealand. Under date of July 18 he wrote from Tahiti saying that the survey of the islands of Tahiti and Moorea had then been completed with gratifying results, since several new varietal forms had been discovered, connecting types and localities previously unrelated. The ethnological results of the expedition were satisfactory also, on account of friendly reception from the old chiefs of the native tribes and through the occurrence of a great annual feast that brought together many groups of people from different districts.

DURING the summer word came from Mr. V. Stefánsson under date of February 8 giving a brief résumé of his trip westward from Flaxman Island along the coast to Wainwright Inlet, which is a week's journey, say about one hundred miles, southwest of Point Barrow and back again to Cape Smythe near Point Barrow, where he spent a large part of the winter, while the sun was below the horizon. Not much can be done during the dark days of winter, but Mr. Stefánsson improved the time at Cape Smythe, where he was the guest of Mr. Charles Brower, Director of the Cape Smythe Whaling and Trading Company's station, by making physical measurements of the Point Barrow Eskimo, compiling notes on their dialect and transcribing their folk-lore tales, in all of which much valuable assistance was received from Rev. H. R. Marsh, M. D., Presbyterian missionary and physician of the U. S. Bureau of Education, and Mr. C. W. Hawsworth, the resident school master. At the time of writing, Mr. Stefánsson was planning to leave Point Barrow the latter part of February to go eastward to Cape Bathurst and beyond and was expecting to send a report from MacPherson near the mouth of the Mackenzie about the middle of July.

MESSRS. HERBERT LANG and JAMES CHAPIN of the Department of Mammalogy sailed from New York May 8 for Antwerp, whence they proceeded on June 3 for the upper Congo district for the purpose of making a zoölogical survey of the basin of the Congo for the benefit of this Museum. The Belgian authorities have provided every facility possible for the assistance of the expedition in attaining its objects and Messrs. Lang and Chapin with their outfit reached Matadi in the Belgian

Congo on June 24. They are now at or in the vicinity of Stanleyville in the highlands of the upper part of the river. This place is healthful and will be made the headquarters from which to set out on periodical excursions into the surrounding country, until the purposes of the expedition have been accomplished. Mr. Lang reports that there is a poverty of desirable animal life, particularly birds, in the vicinity of Boma and Matadi, the region being one of barren hills. The Stanleyville region, however, abounds in game, and the necessary permission has been secured for collecting all forms of animal life, including the right to capture two specimens of the rare okapi, which seems to be a member of the giraffe family. King Leopold has previously shown his interest in the Museum by the donation of a large collection illustrating the Congo peoples; and now the Belgian government, in addition to the unusual privileges granted, has contributed largely toward defraying the expenses of the present expedition.

Mr. C. E. AKELEY, the noted collector of African big game, left New York August 17 for British East Africa, where he will continue studies begun during former expeditions and will make collections for the American Museum. The expedition will require two years, and, besides obtaining a group of elephants to be mounted here amid a reproduction of their natural habitat, will devote much time to making a complete photographic record of the people, fauna and flora. A moving picture camera has been taken for the purpose of getting pictures of army ants on the march and other movements of animals.

THREE important additions have been made to the collection of meteorites in the Foyer: the 682-pound iron to be known as Guffey, but as yet undescribed, the section of Gibeon (West Africa) which was secured by the Museum last year, as noted in the *JOURNAL* for April, 1908, and a 20-pound mass of the aërolite "Modoc," which is the largest piece of this fall that has been found and was acquired by the Museum in January of this year.

THE upright cases in the gallery of the East Wing (third floor, No. 306) are in process of rearrangement to illustrate in diagrammatic fashion evolution among living mammals and relationship with fossil forms. This is done by means of wedge-shaped cores within the cases around

the bottom of which horizontal bands of color represent Cretaceous and the great subdivisions of Tertiary time, the space above the bands being devoted to the installation of mounted specimens illustrating the principal subdivisions of mammals. Converging lines extend downward, meeting in the band standing for the geological period in which the zoölogical group is known or supposed to have originated. Many difficulties surround this effort at graphically representing a natural classification, hence the present scheme can only be regarded as an experiment subject to modification.

At the May meeting of the Board of Trustees two classes of membership were added to the Museum. Benefactors are persons contributing or bequeathing \$50,000 in cash or securities, and Sustaining Members are those who contribute \$25 annually to the funds of the institution.

SINCE our last issue the following persons have been elected to membership in the Museum: PATRON, MRS. ANDREW CARNEGIE; Fellows, MRS. HENRY O. HAVEMEYER, and MISSES CAROLINE PHELPS STOKES and OLIVIA E. PHELPS STOKES; Honorary Fellow, BARON LUDOVIC MONCHEUR; Life Members, DOCTORS JOHN HENDLEY BARNHART and CARROLL DUNHAM, MESSRS. WILLIAM G. DE WITT, DANIEL B. FEARING, J. HORACE HARDING, FREDERICK DELANO HITCH and ROBERT S. WOODWARD and MRS. EDWARD S. HARKNESS; Sustaining Members, MMES. CLARENCE H. MACKAY and M. ORME WILSON; Annual Members, MESSRS. GEORGE J. BASCOM, NATHAN D. BILL, CLIFFORD V. BROKAW, FRANKLIN Q. BROWN, GEORGE S. CLAPP, CLARENCE M. CLARK, G. D. COCHRAN, J. CLARENCE DAVIES, DANIEL EDGAR, JOHN W. EDMONDS, L. C. HANNA, GEO. L. INGRAHAM, WILLIAM H. KELLY, DAVID KEPPEL, LEROY MCKIM, EDWIN O. MEYER, ROBERT B. MEYER, A. PAGENSTECHER, CHAS. W. PARSONS, G. RAMSPERGER, J. G. TIMOLAT, JOHN R. TOTTEN, ELMER R. VACTOR and W. A. WHITE, GEN. ALEXANDER SHALER, REV. J. L. ZABRISKIE, A. ALEXANDER SMITH, M. D., MMES. JOSEPH S. AUERBACH, ELI BERNHEIM, URBAN H. BROUGHTON, EDWIN M. BULKLEY, DANIEL C. FRENCH, WILLIAM E. ISELIN, WILLIAM M. KINGSLAND, ANGELINE J. KRECH, S. NEUSTADT, MARION STORY, ROBERT E. WESTCOTT, RICHARD H. WILLIAMS and FRANCIS DANA WINSLOW and MISSES CAROLINE HARRIOT, IRENE LEWISOHN, FAITH MOORE, MARION MOTT, GLADYS F. WATERBURY, L. WHEELER and DOROTHY P. WHITNEY.

LECTURE ANNOUNCEMENTS.**MEMBERS' COURSE.**

The first course of lectures for the season 1909-1910 to Members of the Museum and persons holding complimentary tickets given them by Members will be given in November and December.

PUPILS' COURSE.

The lectures to Public School children will be resumed in October.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30.

October 5.—MR. CHARLES S. BULLOCK, "Uncle Sam's Farm." Illustrated by stereopticon views.

October 12.—MR. EDWARD RUSSELL PERRY, "The Pacific Northwest." Illustrated by stereopticon views.

October 19.—MR. HOMER C. BRISTOL, "Northern California." Illustrated by stereopticon views.

October 26.—MR. HOMER C. BRISTOL, "Southern California." Illustrated by stereopticon views.

Saturday evenings at 8:15 o'clock. Doors open at 7:30.

DR. WILLIAM L. ESTABROOKE, of the College of the City of New York,—the first of a course of eleven illustrated lectures on inorganic chemistry.

October 9.—"Physical and Chemical Change."

October 16.—"Oxygen and Ozone."

October 23.—"Hydrogen and Hydrogen Peroxide."

October 30.—"Water."

Children are not admitted to these lectures, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.



The Indians of Manhattan Island and Vicinity

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A GUIDE TO THE
HUDSON-FULTON EXHIBIT
AT THE
AMERICAN MUSEUM OF NATURAL HISTORY

No. 29 of the Museum Guide Leaflet Series.

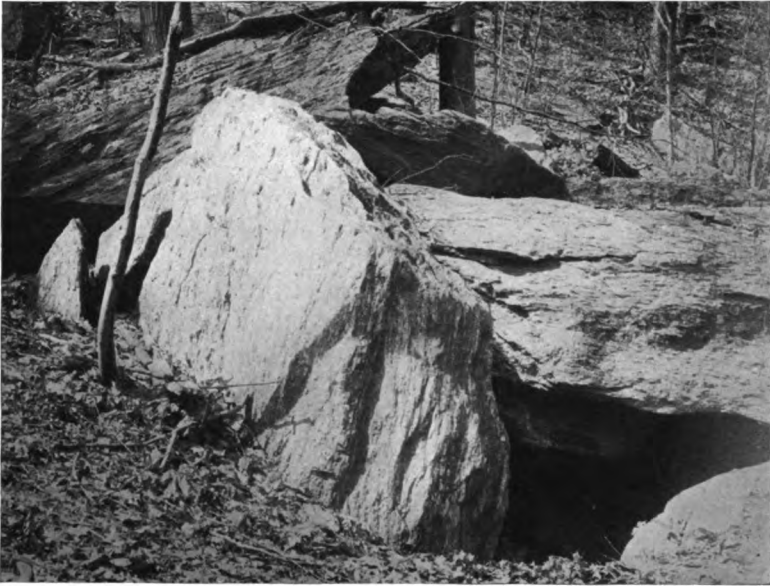


FIG. 1. INWOOD ROCK-SHELTER, MANHATTAN.

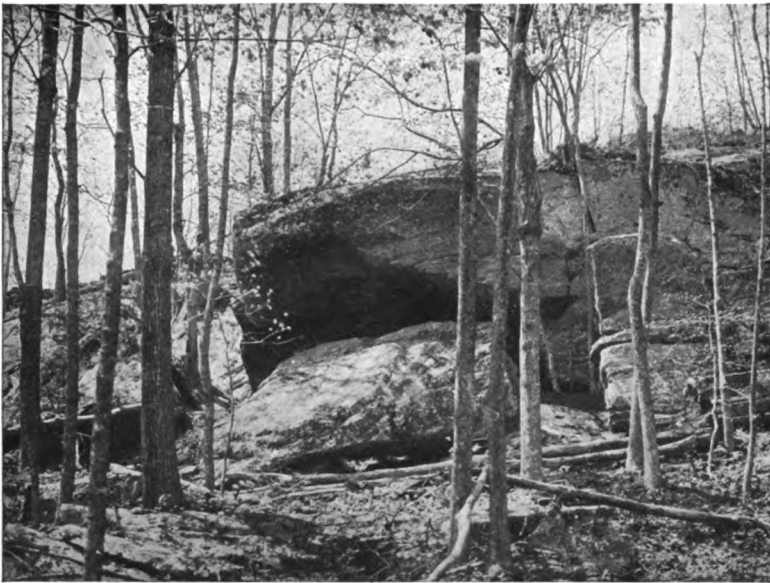


FIG. 2. FINCH'S ROCK HOUSE.

THE INDIANS OF MANHATTAN ISLAND AND VICINITY.

BY ALANSON SKINNER,
Department of Anthropology.

Introduction.

AS a part of the Hudson-Fulton celebration, a special exhibit representing the Indians of New York has been arranged in the West Hall, on the ground floor of the Museum. The low, or table cases, contain implements of stone, bone, shell and other materials, found on Manhattan Island and in and around Greater New York,—implements once used by the Indians occupying this region. In the upright cases will be found ethnological objects, many of which are still in use among the surviving Iroquois Indians of New York State. This guide, therefore, refers chiefly to the remains of Indians found upon Manhattan Island and adjacent shores, examples of which are shown in the table cases. The location of the various cases may be seen from the accompanying plan.

In using this guide, the visitor is advised to turn north, as he enters the exhibit and take a general view of the cases in the order designated; then it is suggested that he follow the discussion (pp. 14-36) of the various kinds of specimens found near New York City as he makes a second examination of the exhibits in the table cases.

The Hudson-Fulton exhibition is designed to show the life of the Indians of New York City and vicinity in prehistoric times, when primitive conditions were as yet unchanged by the advent of European settlers. The objects shown have been collected by Museum expeditions sent for the purpose of excavating the ancient village, camp and burial sites of the Indians in several localities within the area indicated, and the exhibits have been prepared from the remains thus secured. The remnants of the tribes that once occupied the primeval forests of Greater New York have so long been scattered and lost that almost nothing can be obtained from them now.

Beginning with the northern half of the exhibit, the visitor will find the first section of the upright case (1)¹ devoted to a few specimens showing some of the more perishable articles formerly in use among the Delaware and Mohegan Indians of this immediate vicinity. Most of these have been collected from the scattered remnants of these people, or else were obtained from old families who, since the disappearance of the natives, preserved

¹ See diagram on page 193.

articles of Indian manufacture in their homes as curiosities. The other portions of this case exhibit the clothing and weapons of the Iroquois.

The first table section (2A) is devoted to an exhibition, as comprehensive as possible, showing the life of the natives in prehistoric times by means of specimens obtained from the ancient village and camp sites. Here may be seen bones of the various animals, fish and shell-fish upon which the Indians depended for subsistence; fragments of nuts, corn, roots and other food products preserved by charring and obtained from ancient fireplaces, and such implements as arrow points of antler and stone, net-sinkers of stone and stone hoes for tilling the fields — all illustrative of primitive methods of hunting and agriculture. Implements exhibited in the same case show the preparation of animal and vegetable food with primitive utensils, while close by are tools used by the Indians in preparing skins. The manufactures of the Indians are illustrated in the immediately adjacent section (2B). A progressive series of implements shows the making of an arrow point from a simple quartz pebble such as might be picked up anywhere on the shore, with the various stages leading to the finished point; the tools employed are also exhibited. Implements of stone for pecking, grooving and polishing; hatchets and axes; pottery fragments, and household utensils, such as hammers, axes, adzes and gouges, will be found at hand.

In the other side of this table case (2B) there is an exhibit from Manhattan Island, made up of specimens principally collected by Mr. Alexander C. Chenoweth in the rock-shelters and village sites at Inwood, showing as fully as possible the life of the prehistoric Manhattan Indians. The exhibit illustrating, by means of models, the manufacture of pottery is especially noteworthy. From the appearance of fragments now to be found on the sites of the ancient Indian villages of this vicinity and the methods of modern Indian pottery makers, we may safely conclude that most, if not all, of the earthenware manufactured in this locality was made by the "coil" process, which consisted of the following steps. The Indians first secured clay of a suitable quality, which was mixed with pounded shell or stones to make it tougher and more durable. It was then worked into long rolls, and the Indian, beginning at the bottom, worked the pot up by adding coil after coil, blending or smoothing the coils with a smooth stone until they did not show from either the interior or exterior surface. The potter's wheel was not known to the aborigines in the olden days. When the pot was completed, it was decorated by stamping or incising designs about the exterior of the rim.

In the next table case (3A) are to be seen implements and remains from the shell heaps marking the long-forgotten Indian villages at Shinnecock Hills, Long Island. This exhibit, which is one of the most complete of its kind, gives a rather adequate picture of the ancient life of these people

and is especially valuable for the number and variety of primitive manufactures shown. One of the most interesting of the sections demonstrates, by means of a series of specimens, the primitive methods of cutting bone and antler employed by these Indians. Bone was cut by notching or grooving it with a stone knife or flake and then breaking it at the groove. Antler was worked in the same way, but it is very probable that the Indians boiled antler in order to make it more pliable and easily cut.

In the western side of this case (3B) there is a series of specimens collected from an ancient Indian village situated on the site of the Parade Ground at Van Cortlandt Park. In the adjacent section some specimens from Long Island in general are shown.

The upright case (4A) at the end contains an exhibit from the Iroquois Indians of New York State, and the small wall case (6) on the side shows a section of a shell heap with a map showing the location of most of the

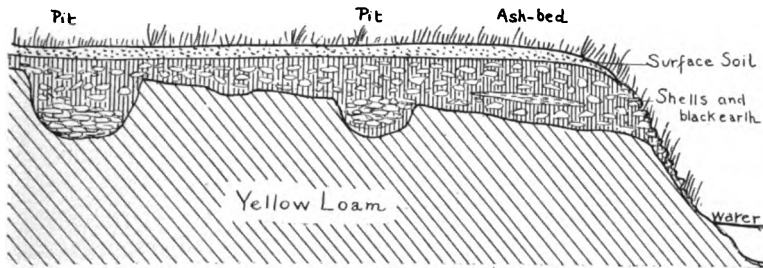


FIG. 3. DIAGRAM OF A TYPICAL SHELL DEPOSIT.

Indian villages of Greater New York and vicinity, as well as photographs and labels describing the opening and excavation of the sites. Specimens typical of those found in the shell heaps are also exhibited.

Of all the traces left by the aborigines along the New York seacoast, the most abundant and familiar are the shell heaps — the beds of refuse marking the sites of ancient villages, camps and isolated wigwams. Wherever the fresh water joins the salt and especially where open water for fishing, a creek with its clam beds and a spring for drinking come together in happy combination, there is generally to be found some such evidence of Indian occupation, unless, as is often the case, settlement and improvement have buried deep the shells or carted them away.

The typical "shell heap" is not a heap at all, for leaf mold, the wash from neighboring high ground and often cultivation have made it level with its surroundings (Fig. 3). Very often, unless the land be plowed, no shells whatever show on the surface, and the only way of finding out the conditions

of things below the sod is to test with a spade or a crowbar. If shells are present, their crunching soon gives notice of the fact. Sometimes shell heaps have been located by shells thrown from mole and woodchuck burrows, or by outcropping in gullies washed by the rain, or banks broken down by the surf. They are generally located near some creek or bay on low but dry ground, preferably with an eastern or southern exposure, and, as before mentioned, not far from drinking water. Some have been found fronting on the open Sound, but such cases are rare. These deposits consist of large quantities of decayed oyster, clam and other marine shells mixed with stained earth, with here and there ashes, charcoal and fire-broken stones to mark the spots where ancient camp fires blazed. Among

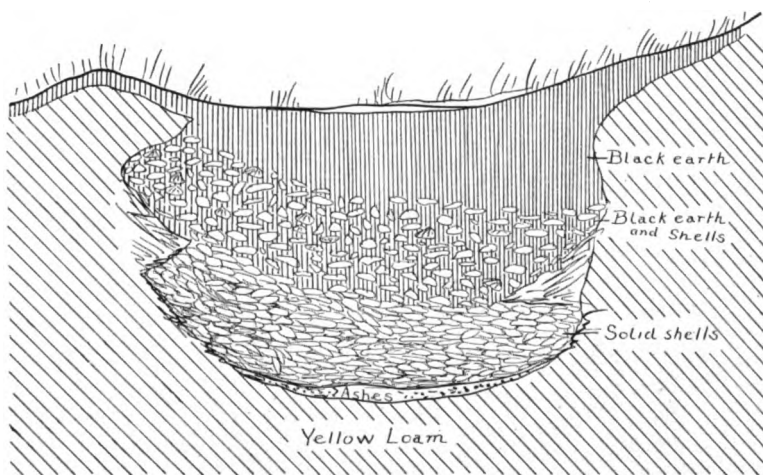


FIG. 4. CROSS SECTION OF A SHELL PIT.

the shells are usually scattered antlers of deer, fish bones, bones of animals and birds split for the marrow, quantities of pottery fragments, and broken implements, in short, the imperishable part of the camp refuse left by the Indians. Now and then, perfect implements and ornaments that had been carelessly lost in the rubbish or hidden for safe-keeping are discovered. Little did the Indian think, as he laid away his little hoard, that his handiwork would never see light again until he and his people had long been gone and forgotten.

Shell heaps vary from a few inches to four feet in depth, and in area from a few square yards to several acres — all depending on the length of time the settlement was occupied and the number of dwellings comprising it. Deep shell heaps are often divided into layers, the lowest of which are, of

course, the oldest. Under and near most of these deposits may be found scattered "pits" or fire holes, which are bowl-shaped depressions in the ground filled with layers of stained earth, shells and other refuse, with an occasional layer of ashes. Some pits are as large as ten feet wide by six feet deep, but the average is four feet deep by three feet wide. It is supposed that they were used as ovens or steaming holes and afterwards filled up with refuse (Fig. 4). Some contain human skeletons, which may have been interred in them during the winter season when grave digging was impossi-

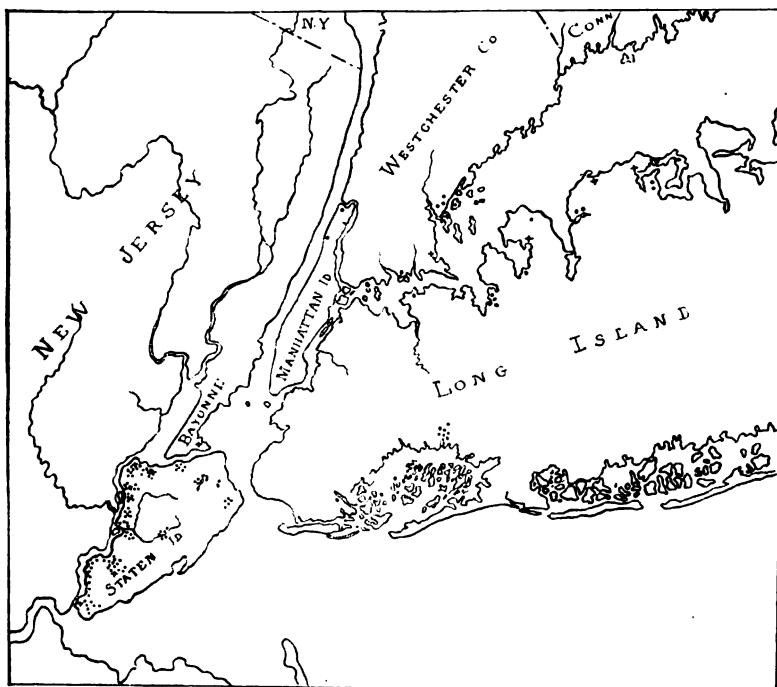


FIG 5. MAP GIVING THE LOCATIONS OF SHELL DEPOSITS

Those marked + have been explored by the Museum.

ble. Pits as a rule, contain more of interest than the ordinary shell layer. The closely packed regular masses of shells form a covering which tends to preserve bone implements, charred corn and such perishable articles from decay in a way that the looser shells of the general layers fail to do.

Shell heaps, while abundant along the seacoast, are seldom found inland, except on salt creeks or other streams having access to salt water. They may be seen all along the east shore of the Hudson River at more or less

frequent intervals up as far as Peekskill, and on Croton Point and between Nyack and Hook Mountain on the west shore they attain considerable size. There are a few small deposits, however, composed mainly of brook clams (*Unio*) situated on fresh water lakes in the interior of Westchester County. There are many shell heaps on Staten Island. Shell heaps occur or did occur on Constable Hook, New Jersey, and at intervals between there and Jersey City along the western shore of New York Bay. The accompanying map (Fig. 5) gives the location of the important known shell deposits of the vicinity of New York City.



FIG. 6. GRAVE OF SKELETONS WITH ARROW POINTS.

On the opposite side (4B) of the upright case, the Iroquois exhibition is continued, but the last section is devoted to a small exhibit showing the manufacture of wampum by the Indians of Long Island with prehistoric implements and a number of specimens of wampum belts and strings collected from the Iroquois of New York and Canada.

The wall case (5) at the western end of the room contains a group illustrating the costumes of the Iroquois Indians of a period from about 1790 to the present day.

Beginning on the south side of the aisle, the easternmost upright case

(7) is devoted to the False Face Society of the Iroquois, while the table case (8A) immediately following contains objects from Westchester County and Staten Island. In these sections an interesting feature of aboriginal life is shown. Although most of the Indians of the vicinity of Greater New York did not place objects in the graves with their dead, some graves at Burial Ridge, Tottenville, Staten Island, when opened for the Museum in 1895, were found to contain a great many interesting and valuable remains. With the skeleton of a child there was a great deposit of utensils, both finished and unfinished ornaments, such as beads, pendants, and the like, a stone pipe and a number of other objects, while not far away the skeletons of three Indian warriors were exhumed (Fig. 6), in and among whose bones there were found, as shown in this section, twenty-three arrow points of stone, antler and bone (Fig. 7).

This is an excellent exhibit indicating the use of the bow in Indian warfare. The skeletons lay side by side with the legs flexed as shown in the illustration (Fig. 6). In the first skeleton, it was found that two points of antler and one of bone had pierced the body and lodged near the spinal column. Another point of argillite had been driven between two ribs, forming a notch in each. A bone arrow point had struck the shoulder and was resting against the scapula. Among the bones of the right hand, an arrow point of antler was discovered, and there was a similar one near the left hand. Another antler point was lying in the sand just beneath the body and had, no doubt, dropped from it when the flesh wasted away. The most interesting wound of all was one where an antler-tipped arrow had ploughed through one side of the body and fully one-third of the point had passed through one of the ribs, making a hole, where it remained, as smoothly as if drilled. The second body was also terribly injured. The left femur showed an elongated puncture near the lower end, probably made by an arrow point. Among the ribs was the tip of an antler point, and a yellow jasper one was among the ribs on the left side of the body. Three other points were among the bones. The third skeleton was likewise an example of old-time bow play. There was an antler point among the ribs on the left side. The end of one of the fibulæ was shattered by a stone arrow point, and a second point had lodged between two ribs. Beneath the sternum was a flint point, and the right shoulder blade showed a fracture near the end, caused by a blow of some hand implement or an arrow. Near the base of the skull, the end of an antler arrow point was discovered, broken perhaps by its impact with the occiput. Two bone points were near the lower bones of the left leg. A second point was found upon search among the left ribs; under the vertebræ was the base of another antler point, and two broken points were found beneath the body.

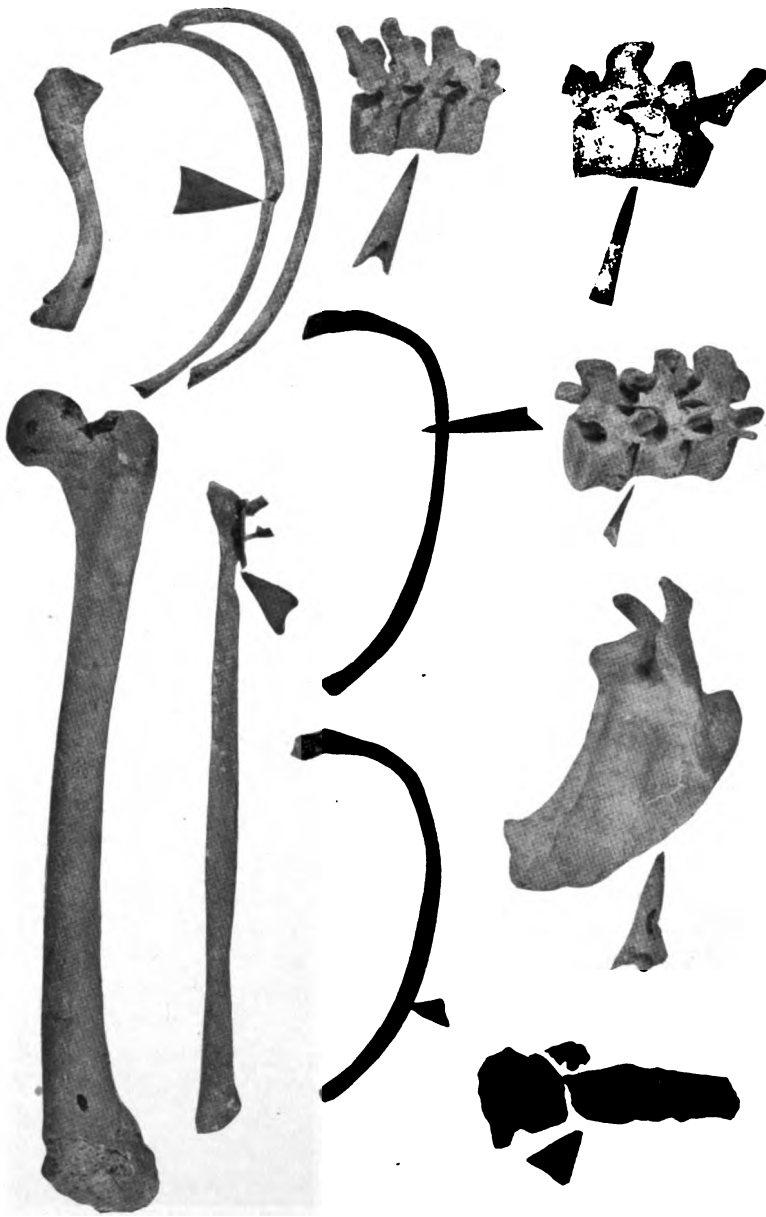


FIG. 7. BONES PUNCTURED BY ARROW POINTS, FROM SKELETONS FOUND ON STATEN ISLAND.

The position in which several of the points were found certainly speaks well for the great force which propelled them. The long bows of the local Indians must indeed have been formidable weapons. Taking into consideration the number of arrows which must have been imbedded in the bodies of the warriors, it is perhaps probable that the majority of the projectiles were driven into the victims at close range after death.

In the wall case (11) south of the exhibit will be found the model of a rock-shelter and typical objects found in such places. These, as the name implies, are protected spots in rocky ledges, where Indians once made more or less permanent places of abode. Many such shelters exist in the vicinity of New York, one or two having been discovered at Inwood, Manhattan (Fig. 1). The most important rock-shelter so far discovered is the so-called

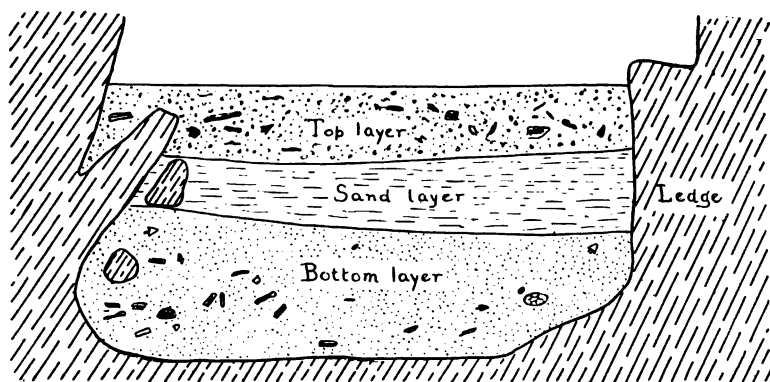


FIG. 8. VERTICAL SECTION OF REFUSE IN FINCH'S ROCK HOUSE, ABOUT MIDWAY OF THE CAVE.

Finch House (Fig. 2) reproduced in the model. The original is near Armonk, Westchester County, New York. One point of special interest is the fact that the Finch shelter contained two layers bearing relics separated by sand as shown in the drawing (Fig. 8). As no pottery was found in the bottom layer, it has been inferred that we have here the remains of two different races of Indians, the older not yet advanced to the pottery-making stage. This conclusion, is, however, far from final, for the whole arrangement may be due to accident.

The table case 8B contains objects selected from the Henry Booth collection illustrating the life of the Indians of the Upper Hudson. They are especially interesting on account of the number of ceremonial "banner stones" found in that region, which are apparently not nearly so abundant anywhere else in this vicinity.

In the next table case the section 9A is devoted to the life history of some of the Iroquois tribes other than the Five Nations of western New York, and the following section (9B) shows, as well as possible, the culture of the Iroquois Indians of central New York and objects used by the Indians of New York State in general manufacture or obtained from the Europeans upon the advent of the settlers. In the upright case (10A) there is presented an exhibition of pottery vessels, all but one of which were found within the limits of Greater New York, and some implements from the Iroquois of the Mohawk Valley, besides material illustrating the societies of the Iroquois. On the other side, (10B), the entire case is filled with specimens from the Bolton and Calver collection from Manhattan Island, which will be more fully described below.

The Types of Indian Relics found in and about New York City.

Having now taken a general view of the exhibit, the visitor may be interested in a study of the several kinds of relics found in this locality. As these types are somewhat different from those found in near-by regions, we conclude that the Indians formerly living here had habits and customs different from those of their neighbors. For want of a better name, these long-extinct tribes have been called the New York Coastal Algonkin. The term Algonkin designates the language they spoke, while the adjective defines their habitat.

In the term New York Coastal Algonkin, the writer includes the tribes along the coast from Tottenville, Staten Island, the extreme southern point of the state, to the Connecticut boundary on Long Island Sound, including to a certain extent the shores of New Jersey immediately adjacent to Staten and Manhattan Islands, the east bank of the Hudson River as far north as Yonkers, and exclusive of Long Island except the western end. From the examination of the remains of the New York Coastal Algonkin area preserved in many collections, both public and private, it becomes obvious that the objects found may be roughly divided into three groups: articles of stone, articles of bone and antler, and articles of clay, shell and metal. The first group is, from the imperishable nature of its representatives, naturally the largest and comprises a number of sub-groups to be briefly described and commented upon in this paper. Examples of this type will be found in the table cases previously mentioned. For the following descriptions and historical notes the author has largely drawn on Mr. James K. Finch's and his own contributions to Volume III of the "Anthropological Papers of the American Museum of Natural History" (New York, 1909).

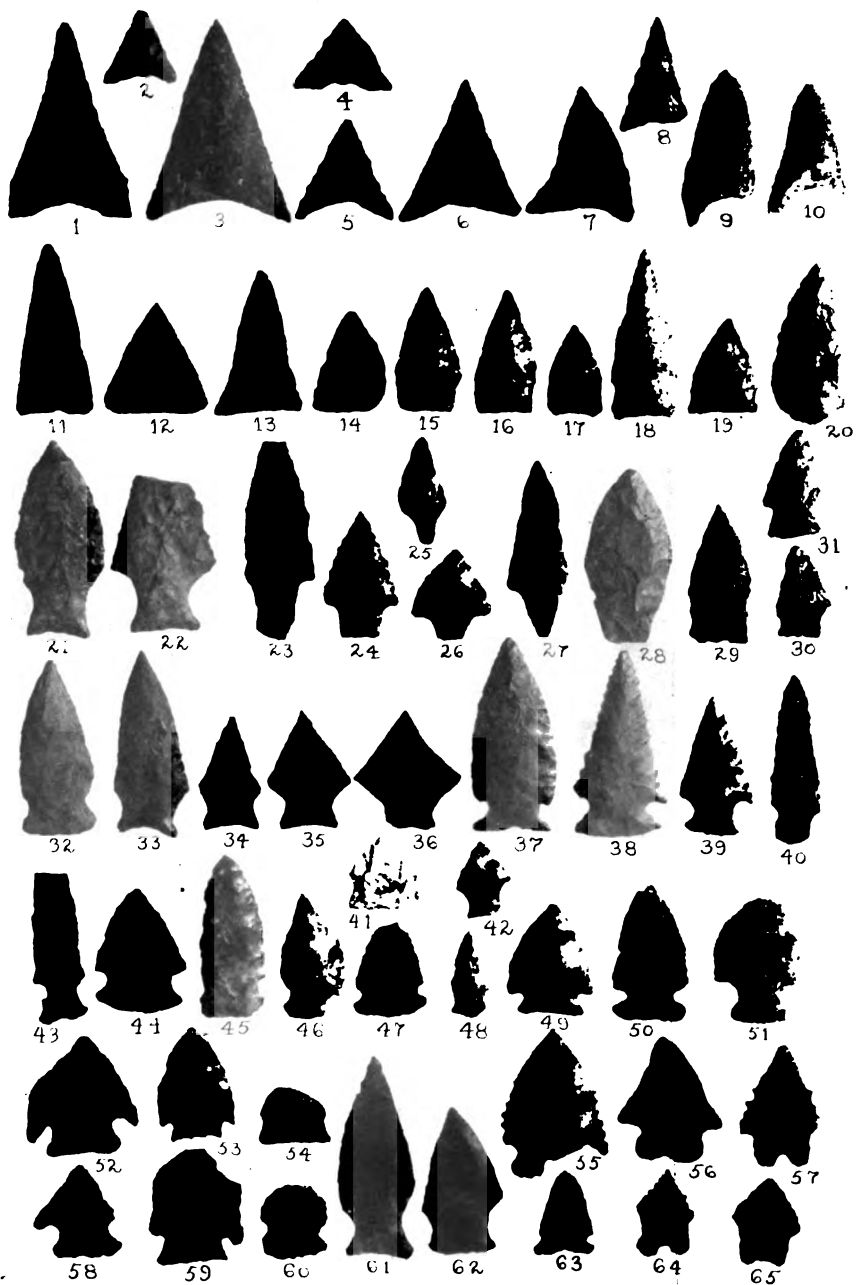


FIG. 9. TYPES OF ARROW POINTS.

CHIPPED ARTICLES.

Arrow Points (Fig. 9). Two general types may be recognized, and these are the stemmed or notched, and the triangular forms. The former are by far the most abundant, and while these are usually made of the nearest local rock possessing the necessary conchoidal fracture, in some cases they are of material brought from a long distance. Specimens made of pink flint resembling stone from the Flint Ridge of Ohio, and of jasper found to the south of this region have been recorded. Blunt arrow points are rare, the Indians probably preferring wooden arrows for this type. Many of the so-called "blunt-points" found in collections, appear to be scrapers made over from broken arrow points of a large size.

The triangular type has long been regarded by the local collectors of this vicinity as being the type used in war, the argument being that as it has no stem, it was necessarily but loosely fastened in its shaft and, if shot into the body, would be very liable to become detached and remain in the flesh if any attempt were made to withdraw it by tugging at the shaft. While it was no doubt perfectly possible to fasten a point of triangular shape to the shaft as firmly as a notched point, the discoveries of Mr. George H. Pepper at Tottenville, Staten Island, where twenty-three arrow points were found in and among the bones of three Indian skeletons, tend to strengthen this theory. While the majority were of bone or antler, all those made of stone were of this type, and indeed most of the bone points were also triangular in shape. However, it is well to bear in mind that arrow points of triangular type have been used for every purpose by all the early Iroquois tribes of New York.

Spear Points and Knives (Fig. 10). None of the early accounts of contemporary European writers seem to mention the use of spears (other than bone or antler-headed harpoons) by the Indians hereabouts, and it is probable that the larger arrow-point-like forms found were used as knives or cutting tools. They are usually notched or stemmed, rarely triangular, and occasionally round or oval. They vary in size, but it must be remembered that one tool may have had various uses, and that drills, knives and scrapers may often have been combined in one implement.

Scrapers (Figs. 10 and 11). Scrapers were probably used in dressing skins, and in sharpening bone implements, woodworking and for various other purposes. These are usually mere flint flakes chipped to an edge on one side. Nevertheless, notched and stemmed forms, requiring some care in their making do occur. Broken arrow points were occasionally chipped down to serve this purpose. A single serrated scraper has been found.

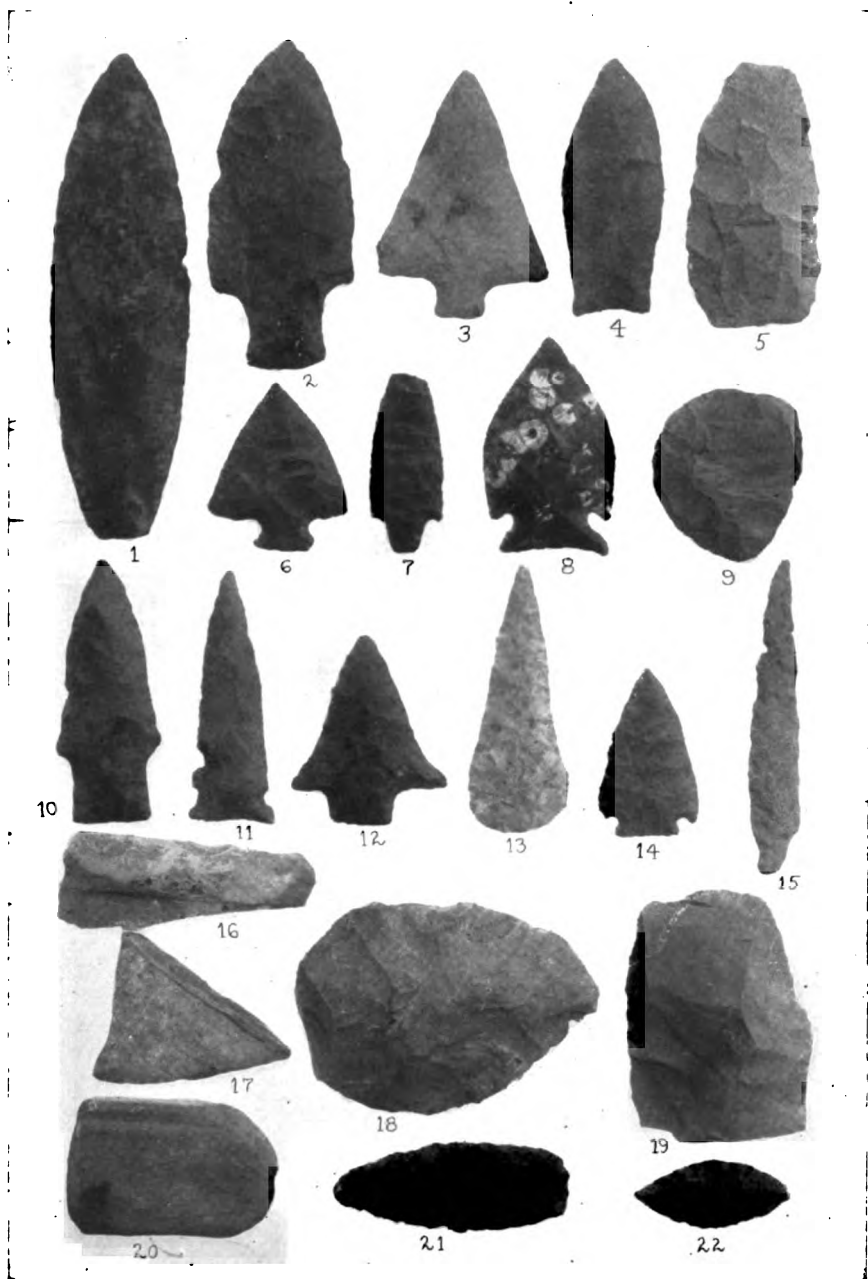


FIG. 10. KNIVES AND SCRAPERS.

These are very rare in both the Algonkian and Iroquoian areas of New England and the Middle Atlantic States. One very large stemmed scraper, of a type more common in the far west, also comes from this locality.

Drills (Fig. 11). These are usually chipped tools presenting an elongated narrow blade and a considerably swollen or expanded base, suitable for grasping in the hand. In some cases the base was absent and those were probably hafted in wood. Specimens whose blades have a square or rectangular cross section are very rare. The finding of cores left in half-drilled objects shows the use of a hollow drill, and it has been suggested that a hard hollow reed used with sand and water on a soft stone would produce this effect. To bear out this assertion, it has been reported that a half-drilled implement has been found (outside this area on the upper Hudson) in which the remains of the reed drill were found in the cavity left by its action.

ROUGH STONE ARTICLES.

Hammerstones. These vary from simple pebbles picked up and used in the rough, showing merely a battered edge or edges acquired by use, to the pitted forms. They are generally mere pebbles with a pit pecked on two opposite sides, perhaps to aid in grasping with the thumb and forefinger. Some have battered edges, but many have not, suggesting, when round and regular, a use as gaming or "Chunké" stones, or as implements used only in pounding some soft substance. Hammerstones, pitted on one side only, and others with many pits on all sides, occur. These latter may have had some special use, and are not to be confounded with the large flat, slab-like stones having pits only on one side, found in other regions, and perhaps used as receptacles for holding nuts while cracking them. While these are common in the Iroquoian area, they are unknown here.

Large stones, single or double pitted, resembling oversized hammerstones occur, and these may have been used as anvils in chipping flint or for like purposes.

Grooved clubs or mauls, also showing use as hammers are found. These are rare and are usually either rough pebbles, grooved for hafting, as in the case of the grooved axe, or grooved axes, the blades of which have become so battered, broken and rounded by wear as to preclude their further use for chopping.

Net-sinkers. On all sites near the water, either salt or fresh, net-sinkers show the prevalence of fishing. These are of two types. In one case a pebble is notched on opposite sides of either the long or broad axis; in the other a groove is pecked around the entire pebble in the same manner. The

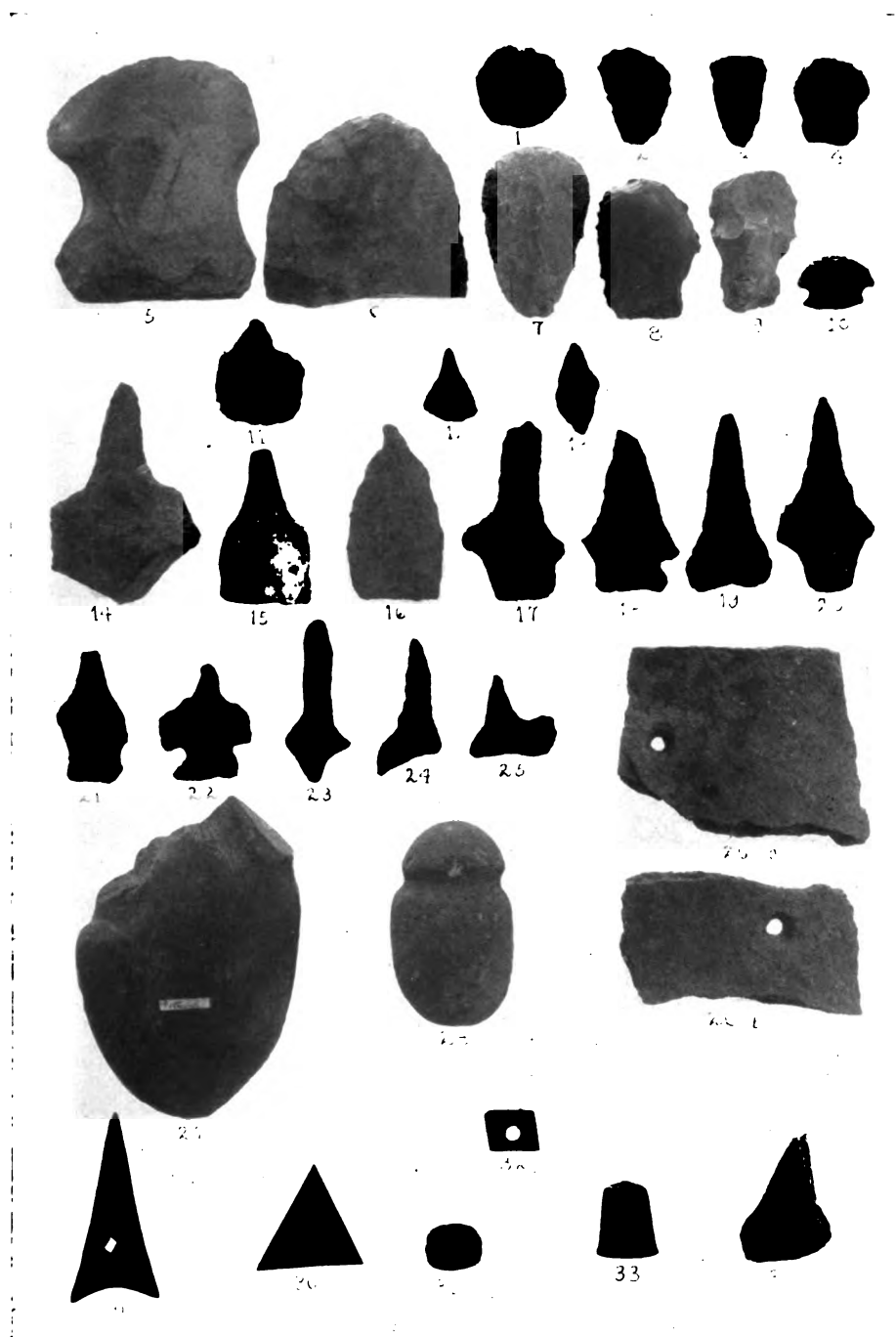


FIG. 11. DRILLS, SCRAPERS AND OTHER OBJECTS.

latter type is comparatively scarce, as the former, being more easily and quickly made, was just as useful to the savage. The modern Cree and Ojibway, residing in the forests north of the Great Lakes, still use pebbles for this purpose, but those observed by the writer were not notched or worked in any way. Occasionally, sinkers notched on both axes are found in this region.

Hoes. These are usually ovoid implements, chipped from trap rock and sometimes notched to facilitate hafting, and sometimes not. They usually show a slight polish on the blade, caused by friction with the ground. This stone type of hoe is the form mentioned by early writers; but perhaps hoes of shell, bone or tortoise shell, and wood were used also. None of these, however, are still in existence.

Hand Choppers. Pebbles chipped to an edge on one side, for use as hand choppers, occur. These are occasionally pitted on both sides.

Grooved Axes (Fig. 12). For the purposes of this paper, the writer, while aware that many grooved axes are well made and polished, has decided to include them under the head of "Rough Stone Articles," as by far the greater majority of the grooved axes and celts from this region lack the polish and finish belonging to other articles later to be described. Grooved axes are of two sorts: *a*, those made of simple pebbles, merely modified by grooving and chipping or pecking an edge; and *b*, axes which have been pecked and worked all over and sometimes polished. The latter (*b*) may be said to include:

1. Groove encircling three sides of blade, one side flat.
2. Ridged groove encircling three sides of blade, one side flat.
3. Groove encircling three sides of blade, longitudinal groove on flat side.
4. Groove encircling three sides of blade, longitudinal groove on flat side and opposite.
5. Groove encircling blade.
6. Ridged groove encircling blade.

A seventh type, having a double groove encircling the blade, may occur in this territory, but has never been reported. A specimen from the Hudson River region, just north of the area here dwelt upon, is in the Henry Booth collection in this Museum. While most worked stone axes have been pecked into shape, a few have been fashioned by chipping, but these seem to be rare.

Grooved axes were hafted in various ways. During the summer of 1908, the eastern Cree living in the vicinity of the southern end of Hudson Bay told the writer that their ancestors, who made and used such axes, hafted them by splitting a stick and setting the blade in it, then binding the handle together with deer-skin (probably rawhide) above and below the split. No specimens of the grooved axe in the original haft seem now to be extant

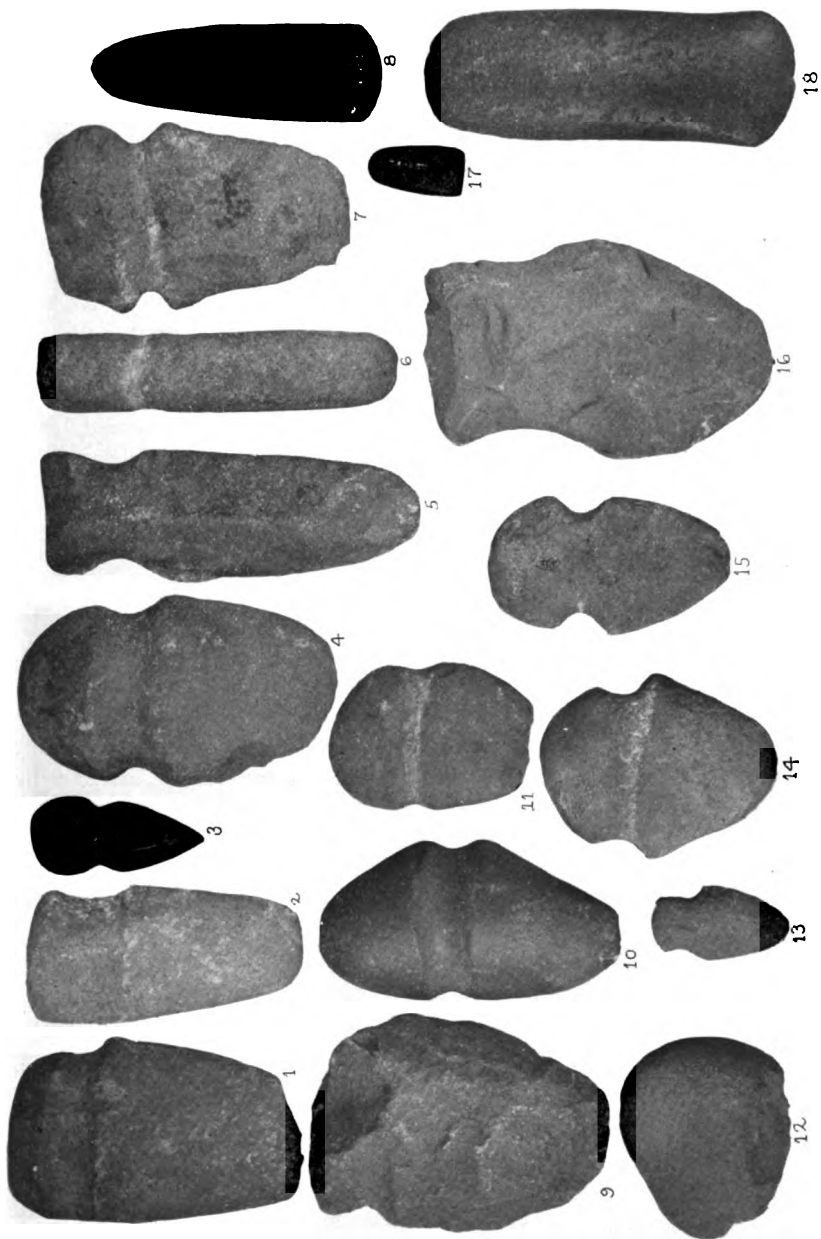


FIG 12. TYPES OF STONE AXES AND CELTS.

from any locality in the East. From the battered appearance of the butts of these axes, it may have been that they were sometimes used in lieu of mauls or hammers. It is possible that they may have been used in war. It is generally supposed that in cutting down trees, making dug-out canoes and other kinds of wood-working, fire was used as an adjunct to the stone axe, the former being the active agent. The process of burning and charring having gone on sufficiently, the stone axe was used to remove the burned portion. However, some stone axes seem sharp enough to cut quite well without the aid of fire.

Celts (Fig. 12). Ungrooved axes or hatchets, usually called *celts*, are frequent throughout this area; but are nowhere as abundant as the grooved axe, especially near the southern border of the region. The grooved axe seems to have been the typical cutting and chopping tool of the local Algonkin. The widespread idea that the celt was sometimes used unhafted as a skinning tool, has no historic proof, but may possibly have some foundation. The Cree of the southern Hudson Bay region use an edged tool of bone for this purpose, a fact which is somewhat suggestive, although the implement differs in shape from the celt. Celts with one side flat and the other beveled to an edge may have been used as adzes. From the worn and hammered appearance of the polls of some celts, it is possible that many of these implements were used as wedges in splitting wood, after constant manipulation in their chopping capacity had permanently dulled their edges.

The celts of this region are, as a general thing, poorly made, a pebble of suitable shape having an edge ground on it with little or no preliminary shaping. More rarely, however, they were carefully worked all over by pecking and polishing, as in the case of the grooved axe.

In type, aside from the general division of rough and worked celts, we may add that most celts in this region have slightly rounded polls, the bit broader than the butt, although some exceptions have been found. The forms are as follows: *a*, rough stone celts, pebbles with one end ground to an edge, but otherwise scarcely worked: and *b*, worked stone celts, which include the following:

1. Wedge-shaped, poll narrower than bit, and angles rounded; common.
2. Like number one, but with bit much broader than poll. Very rare.

Cross-section oval.

3. Like number one, but one side flat, other beveled at one end to make a cutting edge.
4. Like number two, but with cutting edge flaring, broader than body. "Bell-mouthed type." Very rare.

North and west of this region, we find the Iroquois territory where most

worked celts are angular, having almost invariably a rectangular cross section and squared butt. Types 1 and 3 also occur, but the celt with the rectangular cross section seems most typical of the Iroquoian region. Many small celts, made of flat fragments or chips of stone, are also found in this area, and these could scarcely have had a use as chopping tools.

In the Niagara watershed and extending eastward as far as the Genesee valley, an angular adze-like form having a trapezoidal cross section occurs. It is found principally in what was the territory of the Attiwandaronk, Kah-

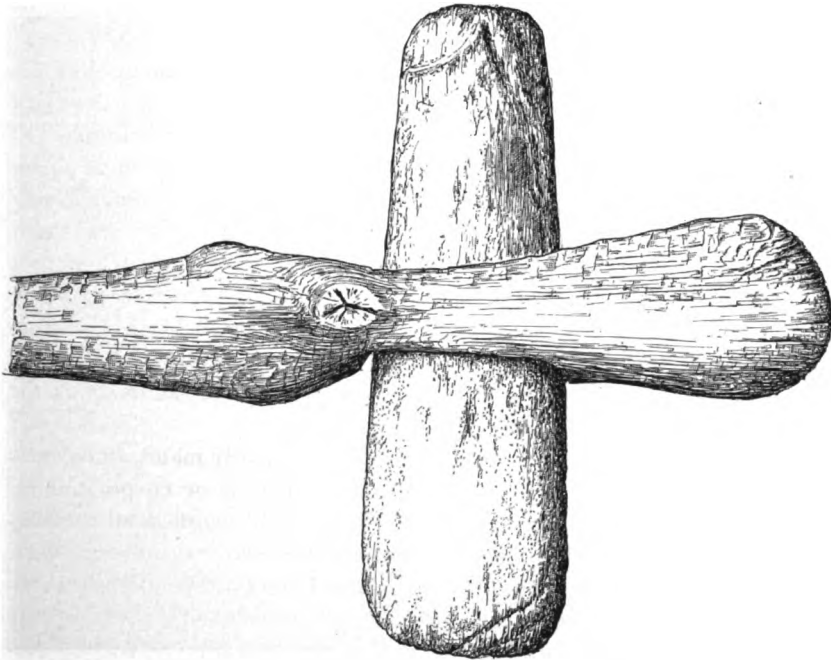


FIG. 13. A HAFTED CELT FROM A POND AT THORDALE, DUTCHESS CO., N. Y.

Length of celt 16.6 cm.

Kwah, or Neutral Nation (an Iroquoian tribe, early annihilated by the Five Nations). It also occurs, as has been stated, on the sites of villages of the Iroquois proper, but is not abundant. South of the Iroquois in central Pennsylvania, another form which does not occur in this region is the chipped celt, usually of flint or other hard stone. This form is, however, frequent in the country about the headwaters of the Delaware.

In the "American Anthropologist," Vol. 9, No. 2, p. 296 *et seq.*, Mr. C. C. Willoughby has figured and described the celts of the New England

region with remarks on the methods of hafting employed. These seem to be two in number, and consist, in the case of the larger forms, of setting the blade through a hole in the end of a club-like handle, the butt or poll projecting on one side and the blade on the other as in Fig. 13, found in the muck of a pond bottom at Thorndale, Dutchess County, New York, a region once in the Mahican territory. Smaller celts were set into a club-like handle, the butt resting in a hole or socket.

Adzes. These seem to be of two kinds, the first and most simple being celt-like, but flat on one side, the other side being beveled to an edge on one side. The second form differs in having a groove, which is not infrequently ridged. Occasionally, adzes with two parallel grooves occur. They were probably hafted by taking a stick at one end of which projected a short arm at right angles with the shaft, laying the flat side of the blade against this arm and binding it on with sinew, thongs or withes. The groove, of course, was of aid in securing the blade to the handle. Adzes of stone, hafted in this manner, have been obtained on the North Pacific coast. The celt adze seems not uncommon, but the grooved adze is rare, neither form being nearly so abundant as in the New England region.

Gouges. The stone gouge is rare, and seems always to be a plain, single-bladed affair without the transverse grooves so frequently seen in New England specimens, and hereabouts is always easily distinguished from the adze. Less than half a dozen specimens have been seen by the writer from this entire area, although probably quite as much work in wood was done by the New York coastal Algonkin as by the New England Indians.

Pestles. The long pestle occurs throughout the region of the Coastal Algonkin of New York, but is nowhere as abundant as in New England. They seem always to have been used with the wooden block mortar hereabouts, and are mentioned by the early writers as part of the household equipment of the natives. They do not seem to have been used by the Iroquois to the north and west of this area either in early or later times. The wooden pestle of dumb-bell shape seems to have been preferred by them. The latter is used by the Canadian Delaware and may have taken the place of the long stone pestle to a great extent in this region.

Mullers, Grinders, and Polishing Stones. These are frequent, and consist merely of rounded pebbles, shaped and worn by use, probably most often in crushing corn. They are mentioned by De Vries as being used by the Indians with a flat stone slab for grinding corn when traveling. Some seem to have been used for polishing stone implements, but it seems hard to draw the line, as the appearance gained from friction would be quite similar. Such mullers and their attendant slabs, used for preparing corn meal have been collected within a few years in use among the Oneida Iroquois of New York, one specimen being in the American Museum collection.

Sinew Stones. These are pebbles showing grooves along the edges, popularly supposed to have been worn there by rubbing thongs and sinews across the edges to shape them. They occur generally, but are not common.

Stone Mortars. These are common, but rather local, some sites having none at all, and others a good many. One locality on Staten Island is notable for the numbers found there, whereas they are rare elsewhere in that vicinity. They may be divided into the following types:

1. Portable mortar, hole on one side.
2. Portable mortar, hole on both sides (New Jersey type).
3. Portable slab mortar or metate, used on one or both sides.
4. Boulder mortar, one or more holes, immovable.

The first two types are the most abundant, the third is not uncommon; but the fourth is very rare, only one or two being reported. As above stated, De Vries claims that the portable mortars were used in bread-making, while the Indians were traveling, but certainly the majority of those found are far too heavy for this purpose.

Pigments and Paint cups. Fragments of pigments such as graphite and limonite, showing the marks of scratching with scrapers, are found, which have apparently supplied the material for painting. Worked geodes are common on many sites. These show traces of chipping in some instances and may have been paint cups. There is a tiny pestle-shaped pebble in the Museum collection from Westchester County, which is said to have been found with a geode of this type. The popular theory is that such geodes were used as "paint cups" and this seems probable.

Stone Plummets. These are very rare, in contrast to their abundance in the New England region. They consist usually of small worked egg-shaped stones, grooved at one end, probably for suspension. The writer has seen but one from this area. Their use is problematic.

Semilunar Knives. Knives of rubbed slate, similar in appearance to the "ulu" or woman's knife of the Eskimo are found, though rarely, in this region. While sometimes ascribed to Eskimo influence or contact, it is possible that this form (which occurs throughout New England), judging by its distribution, may have been native to the eastern Algonkin also. The eastern Cree still use knives of this type as scrapers. Like most other forms common in New England, it is less abundant in the southern part of this area.

Stone Beads. Various pebbles generally perforated naturally are to be found on some sites, and may or may not have been used as beads or pendants. On Staten Island, at Watchogue, Mr. Isaiah Merrill once owned a number of square beads of pinkish steatite (?), all but one of which have been lost, and which he claims were found on his farm.

POLISHED STONE ARTICLES.

Gorget. Two types of the gorget occur. These are the single-holed pendant form, which is the less abundant of the two, and the double-holed type. The latter is flat, rectangular in shape and generally well polished. It usually has two perforations a short distance from the middle. The modern Lenapé of Canada claim to have used these as hair ornaments. Probably the two-holed variety is typical of the Algonkian peoples of this region, the single-holed form being on the other hand, the most abundant on old Iroquoian sites. Specimens of the latter have been obtained in use among the Canadian Iroquois, and some of them are in the Museum collections.

Amulets. Certain problematic articles of the "bar" and even "bird amulet" type have been found, but these are probably exotic in origin and are not characteristic of the archæology of the region in question.

Banner Stones. These beautiful polished stone implements of unknown use may be divided into three great classes, with several sub-types as follows:

1. Notched banner stones.
2. Grooved banner stones.
 - a. Groove on both sides.
 - b. Groove on one side.
3. Perforated banner stones.
 - a. Plain.
 - b. Butterfly.

All three types seem equally abundant, but the notched banner stones appear to be the oldest form and occur under circumstances pointing to great relative antiquity. They are found, however, on the more recent sites as well. Both notched and grooved banner stones are usually more rough in appearance than the perforated type, and the writer has never seen a polished specimen of the first class. On the other hand, the grooved variety frequently exhibits the high degree of finish characteristic of the perforated forms. Banner stones grooved only on one side are less common than the other forms. While the latter class is generally made of slate, steatite or some similar soft and easily worked material the notched and grooved forms, especially the former, are often formed either from naturally-shaped pebbles or chipped roughly into shape. Implements, usually naturally-shaped stones with little working, without notches, grooves or perforations, but greatly resembling the notched and grooved banner stones in shape, are not infrequently found on aboriginal sites hereabouts and may have served as banner stones. There seem to be neither records nor plausible theories as to their use.

Pipes. Stone pipes, invariably made of steatite, are very rare. Four types have been noted as follows:

1. Monitor or platform pipe, platform not projecting before the bowl.
2. Monitor or platform pipe, platform projecting before bowl, with or without tiny carved stem or mouthpiece. Of the latter, one specimen is known.
3. Trumpet-shaped stone pipe.
4. Rectangular stone pipe, human face carved on front of bowl.

It may be remarked that more stone pipes have been reported from the Indian cemetery at Burial Ridge, Tottenville, Staten Island, than from all the rest of the area put together. The second and third types are represented by one specimen each from Burial Ridge and from nowhere else in this region. Four or five pipes of the first class have been found there as well. The last class is represented by a single specimen obtained by Mr. W. L. Calver at Inwood, Manhattan Island. Undoubtedly the clay pipe was the most common form used in this locality.

Steatite Vessels. These are not at all abundant, though occurring almost everywhere. They were doubtless all imported from New England, as there are no steatite quarries within the range of the New York Coastal Algonkin. The single form found is that common in the east, an oblong, fairly deep vessel with a lug, ear or handle at each end (Fig. 14j). Occasionally, such vessels are ornamented by rude incisions along the rim.

ARTICLES OF CLAY.

Pottery Pipes are common everywhere. They are usually manufactured of a better quality of clay than that used for vessels, and bear fairly similar designs. They are susceptible of division into the following classes:

1. Straight pipe, bowl expanding slightly.
2. Bowl much larger than stem, leaving it at an angle of forty-five degrees. Stem round.
3. Same as number 2, but stem angular and much flattened.
4. Effigy pipes, (represented by a pottery human head apparently broken from a pipe bowl, obtained by Mr. M. R. Harrington at Port Washington, Long Island).

The straight pipe seems to have been obtained only on Staten Island on the north shore in the region occupied by the Hackensack. While nowhere as abundant as upon the Iroquoian sites of central and western New York, the clay pipe is rather common and is a prominent feature in the coast culture of New York (Fig. 15a). It is more abundant perhaps in the southern part

of the area, but this may well be due to the fact that data from this region are more easily accessible. The triangular-stemmed "trumpet" pipe so common on the Iroquoian sites is unknown in this region.

POTTERY VESSELS.

The pottery of this region may all be considered as being either the native Algonkian in type or showing Iroquoian influence with a third and intermediate variety. Algonkian vessels may be divided into the following groups according to shape:

1. Conical, pointed bottom, slightly swollen sides, circumference largest at the mouth, — the typical Algonkian pot of this area, Fig. 14a.
2. Like number 1, but much rounder and broader, Fig. 14b.
3. Bottom pointed, sides slightly swollen, neck slightly constricted, Fig. 14c.
4. Identical with number 2, except that just below the beginning of the neck, occur small raised lugs, ears or handles. This is rare from this area, Fig. 14d.
5. Rounded bottom, somewhat constricted neck, lip sometimes flaring, or even turning down and back, Fig. 14e.

The intermediate types are as follows:

6. Rounded bottom, constricted neck, narrow raised rim or collar, Fig. 14f.
7. Like number 6, but with sides more elongated and bottom more oval than round, heavier collar, generally notched angle, with or without a series of small humps or projections at intervals, Fig. 14g.

The Iroquoian types are as follows:

8. Mouth rounded, collar or rim heavy, with humps or peaks at intervals, angle notched, neck constricted and bottom rounded; can stand by itself, an unknown feature in local Algonkian vessels, Fig. 14h.
9. Same as number 7, but with mouth square, and humps at every angle. Much less common than the preceding, Fig. 14i.

In size, the vessels range from small toy-like pots to jars of very large capacity. In general they appear to have been made by the coil process, and are tempered with pounded stone or fine gravel, mica or burned or pounded shell. Sherds showing tempering by fibre or some other substance that disappeared in firing are rarely found. When vessels were cracked or broken, a series of holes was bored opposite each other on either side of the break and the parts laced together, rendering the vessel capable of storing dry objects, at least.

Life forms are exceedingly rare in local ceramic art. From Manhattan Island and Van Cortlandt Park, there come a number of specimens showing incised human (?) faces. This is not an uncommon form on Iroquoian sites in central and western New York. On the Bowman's Brook site at Mariner's Harbor, Staten Island fragments of a typically Algonkian pot were obtained which bore at intervals, rude raised faces. With the sole exception of a rather well-modeled clay face, apparently broken from the

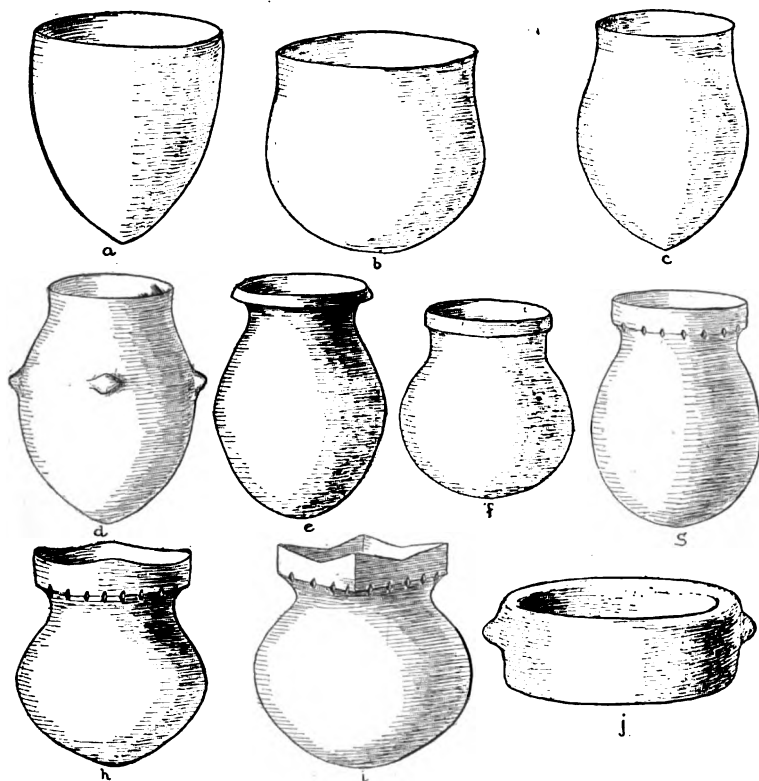


FIG 14. POTTERY FORMS OF THE COASTAL ALGONKIN.

bowl of a pipe (Fig. 15b) found at Port Washington, Long Island, by Mr. M. R. Harrington, this brief statement concludes the list of pottery life forms reported from this area, although others may yet be found here, since some interesting objects have been collected in immediately adjacent territory.

The forms of decoration consist of stamping with a stamp, roulette or paddle, and incision (Figs. 16 and 17.) Occasionally, but very rarely,

stucco work occurs. Under stamping we can enumerate the following processes:

1. Impression with the rounded end of a stick (rare).
2. Impression with the end of a quill, or hollow reed, leaving a circular depression with a tiny lump or nipple (rare) in the center.
3. Impression with a section of a hollow reed, making a stamped circle (rare).
4. Impression with finger nail (doubtful, but perhaps used on some sherds from Manhattan Island).
5. Impression of the edge of a scallop shell.
6. Impression with a carved bone, antler or wooden stamp.
7. Impression of a cord-wrapped stick.
8. Impression with roulette.

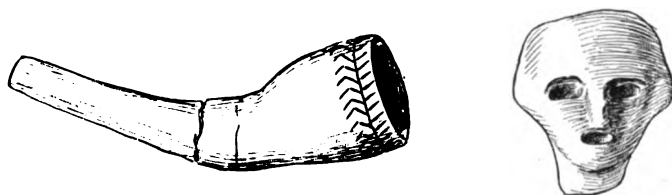


FIG. 15. TYPICAL ALGONKIAN POTTERY PIPE AND FRAGMENT OF AN EFFIGY PIPE FROM PORT WASHINGTON, L. I.

Under the head of decoration by incision we can enumerate the following:

9. Incised decoration, probably made with a stick.
10. Incised decoration, possibly made with a flint object (only one specimen at hand).

The paddle was frequently used to finish the sides and bottom of the pot by imparting an appearance of pressure with fabric when the clay was wet.

11. Stucco. Occasionally, ridges of clay placed on the rim for ornament appear to have been added after the shaping of the vessel.

Ornamentation is usually external, and vessels, either Algonkian or Iroquoian, are rarely ornamented below the rim, although occasionally the designs run part way down the side in the case of the Algonkian forms. Where decoration has been applied by one of the stamping processes, and more rarely by incision, it is sometimes continued over the lip or rim for an inch or less on the inside. This only occurs in the typical Algonkian forms, and is never seen when incised ornamentation is used. The rims of Iroquoian vessels are never ornamented on the interior, nor is stamping so frequently practised on vessels of this class. The intermediate forms, at least the first of the two mentioned, are frequently ornamented on the interior

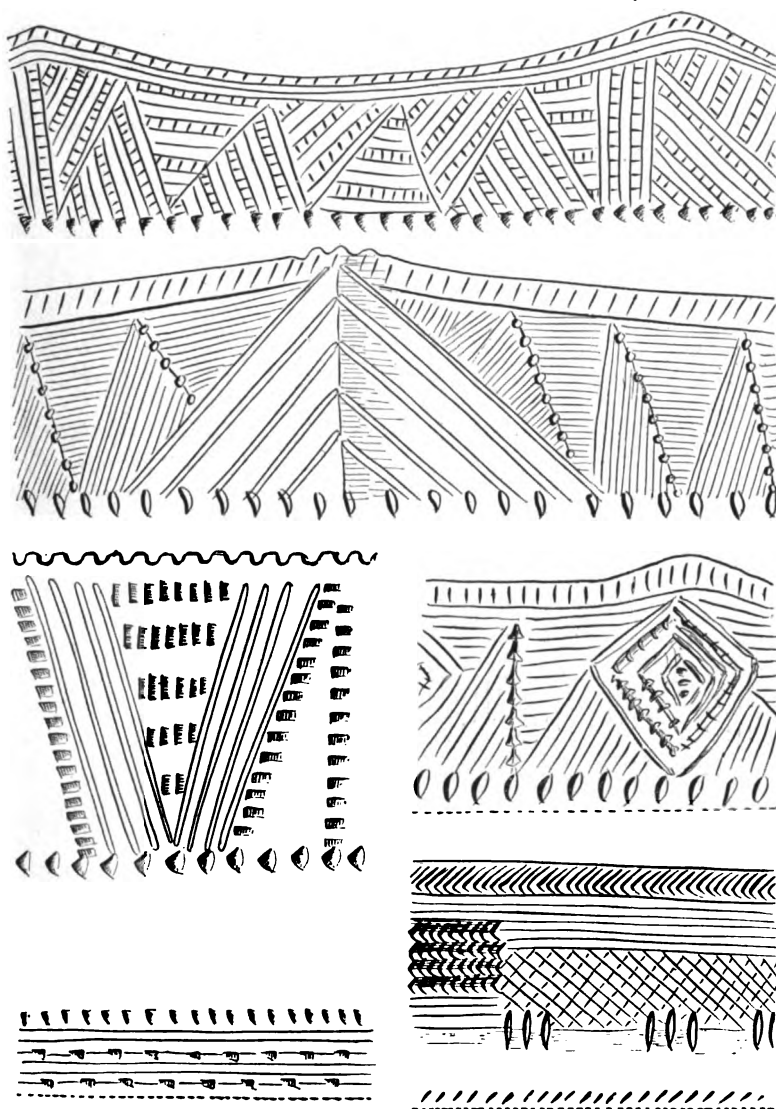


FIG. 16. INCISED DESIGNS FROM POTTERY VESSELS.

a , *b* , and *d* , designs from Iroquoian vessels; *c* , design from an Algonkian vessel; *e* , design from a vessel of the Iroquoian type from a Connecticut rock-shelter, introduced here for comparison.

of the lip. This internal decoration is much more common in the southern portion of this area than elsewhere in the vicinity.

In design, we must of course, give up all thought of trying to obtain symbolism, if such there were, for there are no sources now left upon which to base our assumptions. Certain conventional types of decoration seem to have been in vogue, usually consisting in rows of stamped or incised parallel lines and much more rarely of dots regularly arranged in the same manner. Zigzag, chevron and "herring bone" patterns are the most common, but other angular forms occur, and rows of parallel lines encircling the vessel are sometimes to be found. Stamping and incision as decorative processes never seem to occur on the same vessel. Curvilinear decoration is exceedingly rare, and not enough material is at hand to show that patterns were used, possibly these were scrolls of some form. On account of the lack of material, it cannot be determined whether the designs on the Algonkian



FIG. 17. INCISED DESIGNS FROM ALGONKIAN VESSELS.

vessels differ from those on the Iroquoian, except in a very general and unsatisfactory way.

The angle formed where the heavy rim or collar leaves the constricted neck of the Iroquoian vessel is almost invariably notched, and as such collars and angles do not occur on vessels of the true Algonkian type, this feature is necessarily absent from them. It is noticeable that Iroquoian vessels are usually decorated with incised designs, rather than stamped patterns.

Pottery is found abundantly on the majority of the sites in this district; but, while very much more common than in the New England area, it does not equal in abundance that from the Iroquois country. It is rarely found buried in graves with skeletons as in the Iroquoian area; when sometimes found in graves, however, it is usually at some distance from the human remains and apparently not connected with them. Whole or nearly whole vessels are exceedingly rare and the number of those found up to date may

easily be counted upon the fingers. Potsherds taken from pits or shell heaps, where they have not been exposed to the action of the weather, are often as thickly covered with grease as when they were broken and cast aside.

ARTICLES OF METAL.

Beads. Beads of native metal, consisting simply of pieces of hammered sheet copper rolled into small tubes, have been found, but they are very rare. Copper salts, but no objects, were found upon the bones, especially on those of the head and neck, of a child's skeleton at Burial Ridge, Tottenville, Staten Island, which seemed to predicate the use of copper beads. A great many beads of *olivella* shell, some of them discolored by copper salts, were found about the neck of the skeleton. A single celt of copper is said to have been found in Westchester County, probably on Croton Neck, slightly above the limit of the territory treated in this paper.¹

ARTICLES OF SHELL.

Wampum. Objects of shell are not at all common, and notwithstanding the coast region of New York was one of the best known localities for wampum manufacture on the continent, wampum beads are almost unknown from local sites. With the exception of completed beads, most of which may have been shipped into the interior, wampum may be found in all stages of manufacture. We refer to the white wampum, for traces of the "black" (blue) wampum made from the hard clam or quahog are so far not reported. The process of manufacture may be shown by shells with the outer whorls broken away in steps until the innermost solid column is reached, ground and polished at the end, and needing only cutting off into sections and perforations to make the finished white wampum bead. These do not occur on all sites, though they have been found here and there throughout the region. Ninety-six conch shells with the outer whorls broken entirely away were found in a grave at Burial Ridge, Tottenville, Staten Island, about the head and neck of a skeleton.

Pendants. Occasionally oyster and clam shells, found unworked save for perforations in them, may have been pendants or ornaments, but certainly have little æsthetic value.

Scrapers. Clam shells seem to have been used as scrapers and some are

¹ Native copper occurs in the New Jersey trap ridges, within a few miles of New York City, an important source in Colonial times being near Boundbrook 30 miles from the lower end of Manhattan Island. Boulders of native copper occur in the glacial drift. EDITOR.

occasionally found with one edge showing the effect of rubbing and wearing. These are rare, however. Some may have been pottery smoothers. Clam shells have been reported which contained central perforations and were identical in appearance with some shell pottery scrapers and smoothers collected by Mr. M. R. Harrington among the Catawba. Contemporary writers mention the use of knives made of shell.

Pottery Tempering. This was sometimes done with calcined and pounded shells, but was uncommon, considering the abundance of the material at hand. Pounded stone or gravel seems to have been more favored.

Pottery Stamps. The corrugated edge of a scallop shell was frequently used as a stamp for pottery, as may be seen by examining the potsherds from this region.

ARTICLES OF BONE AND ANTLER.

Objects of bone and antler, while perhaps more abundant here than in New England, are far less plentiful in form and number than in the Iroquoian area. Cut bones are frequent in most shell pits and heaps. They were cut by grooving the bone partly through on all sides, probably with a flint knife, and breaking.

Bone Awls. These utensils are the most common of all bone articles in this region and are found in almost every part of the area. Some are merely sharpened slivers, but others show a considerable degree of work, and are well finished and polished. They are usually made of deer or other mammal bone, but sometimes from the leg bones of birds.

In some instances, the joint of the bone is left for a handle, but this is often cut off. Grooved, perforated or decorated bone awls are extremely rare in this region. While it is generally considered that these bone tools were used as awls in sewing leather, as by modern shoemakers, nevertheless, they may have served as forks in removing hot morsels from the pot or for a number of other purposes. The latter supposition is supported by the abundance of bone awls found in some shell pits. The northern Cree of the Hudson Bay region use a similar bone implement as the catching or striking pin in the "cup and ball" game.

Bone Needles. These are rare, but found in most localities. They are generally made of the curved ribs of mammals and are six or eight inches long, or even longer. They are generally broken across the eye, which is usually midway between the ends. A few with the perforation at one end have been reported.

Bone Arrow Points, usually hollow and conical in shape, have been found,

especially at Tottenville, Staten Island, in the Burial Ridge. They are rather rare, but this may be due to the fact that conditions are not suitable for their preservation in most localities. Others are flat and triangular in shape.

Harpoons. No actual barbed bone harpoons, such as occur in the Iroquois country have been reported from this region; although the writer has seen what appeared to be part of one from Shinnecock Hills, Long Island, whence comes a harpoon barb of bone, found by the writer, now in the Museum collection, which was apparently made to tie to a wooden shaft. While neither of these forms seems to occur within this region, several naturally barbed spines from the tail of the sting-ray, found on the Bowman's Brook site, at Mariner's Harbor, Staten Island, may have been used as harpoons or fish spears, for which purpose they were admirably suited by nature. Long, narrow, chipped stone arrow-heads are generally called "fish points", but they do not seem peculiarly adapted for this purpose and the name is probably a misnomer. No bone fish hooks are reported from hereabouts, though suggested by early writers.

Bone Beads and Tubes. While so abundant on Iroquoian sites, tubes and beads made of hollow bird or other animal bones, polished and cut in sections, are very rare here.

Draw Shaves, or Beaming Tools, made of bone, and probably used for removing the hair from skins, were made by splitting the bone of a deer's leg, leaving a sharp blade in the middle with the joints on either end as handles. The writer has seen none from this immediate region, but they are reported by Mr. M. R. Harrington. A number were obtained for the Museum by Mr. Ernst Volk in the Lenapé sites near Trenton, New Jersey. An implement, evidently made of the scapula of a deer, and perhaps used as a scraper, was found in a grave at Burial Ridge, Tottenville, Staten Island, by Mr. George H. Pepper.

Worked Teeth. Perforated teeth of the bear, wolf and other animals, so abundant on Iroquoian sites never seem to be found here. Beavers' teeth, cut and ground to an edge, occur, and may have been used as chisels, or primitive crooked knives, or both, as they were till recently by some of the eastern Canadian Algonkin. Other cut beaver teeth may have served as dice or counters in gaming.

Turtle Shell Cups. These are common, and consist merely of the bony carapace of the box turtle (*Trachemys carolina*), scraped and cleaned inside, the ribs being cut away from the covering to finish the utensil for use.

Antler Implements. Deer antlers and fragments of antler, worked and unworked, occur in all shell heaps and pits. When whole antlers are found, they usually show at the base the marks of the axe or other implement used

to detach them from the skull. Cut antler prongs, prongs broken from the main shaft and others partly hollowed and sharpened show the process of manufacture of antler arrow points. These are characteristic of this area and are usually conical in shape, hollowed to receive the shaft, and with one or more barbs; not infrequently, however, they are diamond-shaped in cross section. The shaft fitted into the hollow socket as in the case of the conical bone arrow points. A large number were found in and among the bones of human skeletons in a grave at the Burial Ridge, Tottenville, Staten Island.

Cylinders, neatly cut and worked all over, or cylindrical tines made of deer antler only cut and rounded at the ends, are not infrequent, and were probably used as flaking tools in making and finishing arrow points by pressure. One broken cylinder or pin, found on the Bowman's Brook site, Mariner's Harbor, Staten Island, had a rounded, neatly carved head. This specimen, however, seems to be unique.

Pottery stamps, perhaps of antler or bone, but which may be of wood, seem to have been used, judging by the decorations of many pottery sherds. A pottery stamp, carved from antler, was found slightly east of this region, at Dosoris, Glen Cove, Long Island, by Mr. M. R. Harrington, and is now in the Museum collection.

TRADE ARTICLES.

In spite of the frequent mention by old writers of barter of European for Indian goods, the amount of trade material found is small indeed. While it is abundant in the Iroquoian area, all that has ever been found here consists of a few round-socketed iron tomahawks, iron hoes, brass or copper arrow points of various styles, a little porcelain, a few glass beads, Venetian and plain, and some old pipes, notably those stamped "R. Tippet" on the bowl. All these articles are very rare here, and for this no adequate explanation can be given.

RÉSUMÉ.

This area was inhabited during historic times by the following tribes:¹

A. The Lenni Lenapé, or Delaware, ranging from the Raritan River, including Staten Island, to Saugerties on the west bank of the Hudson.

¹ On the map (Fig. 18), these tribes are shown together with the Long Island and other neighboring tribes as indicated by Beauchamp in the map accompanying his "Aboriginal Occupation of New York," New York State Museum, Bulletin 32, Albany, 1900.

Raritan or Assanhican.
 Hackensack.
 Tappan.
 Aquakanonk.
 Haverstraw.

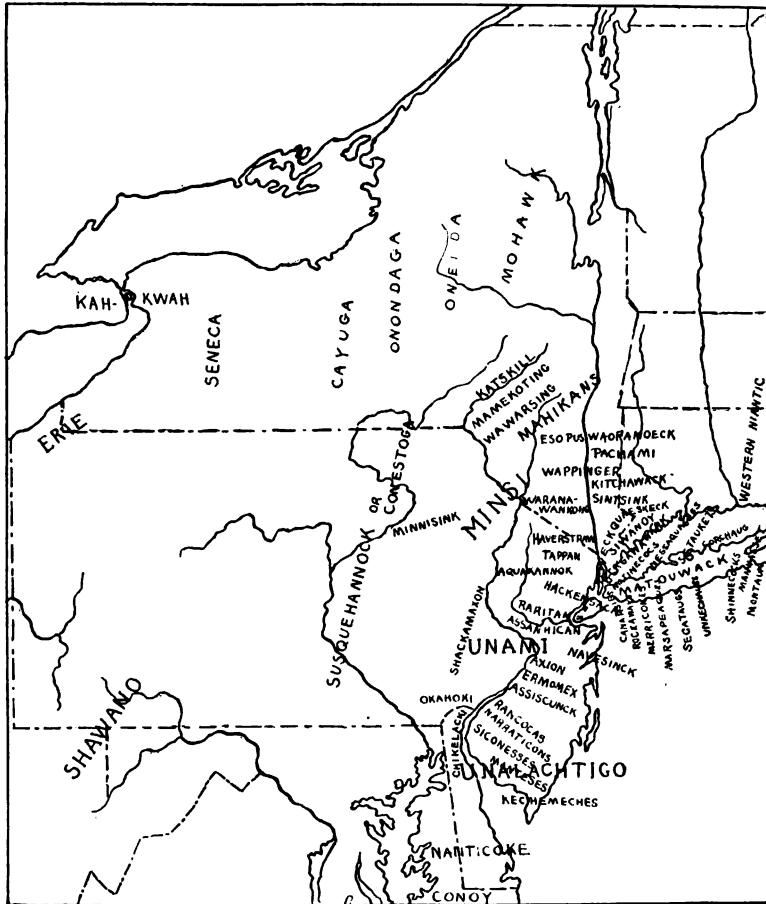


FIG. 18. MAP SHOWING THE LOCATION OF THE NEW YORK COASTAL ALGONKIN AND THEIR NEIGHBORS.

Waranawankong.

B. The Wappinger Confederacy ranging along the east bank of the Hudson, eastward to Connecticut, from Manhattan Island.

Rechgawawank or Manhattan.

Siwanoy.

Weckquaskeek.

Wappinger.

C. Montauk or Matouwack Confederacy.

Canarsie.

These tribes were surrounded on all sides by neighbors of the same stock, who differed somewhat in their language and culture. On the south and west, lay the Lenni Lenapé, or Delaware proper; on the north, the Manhattan, and on the east the New England tribes. Almost without exception, these natives were displaced early in the history of this country, and have been long since expatriated or exterminated. A very few mixed bloods may yet be found on Staten Island, Long Island and in Westchester County, but their percentage of Indian blood is extremely low.

The remains of aboriginal life now to be found, consist of shell heaps, occurring at every convenient point along the coast, on the rivers, and, more rarely, inland; shell, refuse, and fire pits; camp, village and burial sites; and rock and cave shelters. With one prominent exception,¹ few or no relics have been found in graves. The typical interment was of the flexed variety, but bone burials are not infrequent.

Dog skeletons complete and intact, bearing the appearance of having been laid out, are sometimes found buried in separate graves. Some writers have supposed that these individual dog burials are the remains of "white dog feasts" or kindred practices, because the Iroquois even up to the present day hold such ceremonies. The white dog is entirely cremated by the Iroquois, and so far as we have been able to find out, there is no record of such occurrences among the coastal Algonkin; hence, there seems no reason to attribute this custom to them since other Iroquois traits were so infrequent. It seems more probable that such burials are simply those of pet animals, interred as we to-day honor a faithful dog.

Occasionally, the skeletons of dogs and rarely of other animals have been found in graves associated with human bones. The finding of arrow-heads among the ribs of some of these, and other circumstances, seem to point to a practice of killing a favorite animal on the death of its owner to accompany or protect the spirit of its master on the journey to the hereafter.

From their appearance and position, many graves seem to indicate that the dead may sometimes have been buried under the lodge, especially in time of winter, when the ground outside was frozen too hard to permit grave digging. Others under the same circumstances seem to have been buried in refuse pits. The remains further indicate that "feasts of the dead," were

¹ Burial Ridge, Tottenville, Staten Island.

also held at the time of the interment, judging by the quantity of oyster shells and animal bones in and near the graves. Some graves have rows or layers of oyster shells, with the sharp cutting edge upward, placed above the bodies as if to prevent wild animals from disinterring and devouring the dead.

An interesting fact, brought to light by the rock-shelter work of Messrs. Schrabisch and Harrington in their explorations in New Jersey and Westchester County, New York, is that in the lowest and oldest refuse layers of these shelters pottery does not occur. It would be ill advised to infer from this that the earliest occupants were peoples of another culture from the surrounding village dwellers, as the other artifacts found are quite similar to the implements of the latter. Many reasons for this lack of pottery, such as the more easy transportation of vessels of bark or wood through the mountains and hills, suggest themselves, though they are more or less nullified by the presence of pottery in the upper layers. The upper layer, however, may have been made during the period when the natives were being displaced by Europeans and at the same time subjected to Iroquoian raids, when the villages would naturally be abandoned from time to time, for refuge among the cliffs and caves of the mountain fastnesses.

It has been suggested that the rock and cave shelters are remains of an older occupation by people with or without the same culture as the later known savages. The nature of the finds does not support this view, for the specimens obtained are often of as good workmanship as the best to be found in the villages and cemeteries of the latter, while pottery, on the other hand, occurs on the oldest known Algonkian sites. It seems most probable to the writer that, like the shell heaps, the rock and cave shelters form but a component part, or phase, of the local culture, perhaps a little specialized from usage and environment, but contemporary with the villages, shell heaps and cemeteries of the lowlands.

Mounds and earthworks do not occur in the region under consideration, nor does it appear that most of the Indian villages here were fortified, unless they were slightly stockaded. A number of instances of this are known historically, however, and a few earthworks occur just beyond this area.¹

The remains found do not bear any appearance of very great geological antiquity. In a few instances, rock-shelters, shell heaps and village sites seem to possess a relative antiquity; but the oldest known remains, in every case, may be placed as Algonkian with considerable certainty. No paleoliths have been reported, and it would seem from the comparative lack of antiquity of the remains that the natives could not have lived in this region for many centuries before the advent of the whites. The accounts of con-

¹ An earthwork at Croton Point on the Hudson has been excavated by Mr. M. R. Harrington for the American Museum.

temporary writers prove conclusively that these archæological remains, if not those left by Indians found here by the early Dutch and English settlers, must have been from people of very similar culture. In culture, the local Indians were not as high as the Iroquois, nor perhaps as the Lenapé or Delaware proper from whom they sprang; but they compare very favorably with the New England tribes. Absence and scarcity of certain artifacts such as steatite vessels, the long stone pestle, the gouge, adze and plummet, and the abundance and character of bone and pottery articles show them to have been intermediate in character between the Lenapé on the south and west, and the New England tribes on the east and north; and consultations of the old European contemporaries show that this was the case linguistically as well as culturally. Examination of the remains also shows that the influence of the Lenapé on the west, and of the New England peoples on the east, was most strongly felt near their respective borders. Iroquoian influence was strong, as evinced by the pottery, and there is also documentary evidence to this effect. Finally, as is frequent throughout most of eastern North America, the archæological remains may be definitely placed as belonging to the native Indian tribes who held the country at the time of its discovery or to their immediate ancestors.

Historical Notes on the Indians of Manhattan.¹

Historical references to the Indians who occupied this territory in the early days are very confusing and contradictory. There seems to be a great deal of trouble in the use of the word Manhattan. Van der Donck in 1633 classified the Indians of this section by language, and said, "Four distinct languages—namely Manhattan, Minqua, Savanos and Wap-panoos"—are spoken by Indians. "With the Manhattans we include those who live in the neighboring places along the North River, on Long Island, and at the Neversinks."² It is probable that "it was...this classification by dialect that led the Dutch to the adoption of the generic title of Manhattans as the name of the people among whom they made settlements."³ De Laet wrote that "on the east side, on the mainland, dwell the Manhattans," and in 1632 Wassenauer adds that they are "a bad race of savages, who have always been unfriendly to our people" and that "on the west side are the Sanhikans, who are the deadly enemies of the Manhattans."⁴ "When Hudson returned from his trip up the River which now

¹ First paragraph by James K. Finch.

² Wilson, *Memorial History of N. Y.*, Vol. I, p. 34.

³ *Ibid.*, p. 49.

⁴ *Ibid.*, p. 34.

bears his name, he was attacked by Indians in birch or dug-out (?) canoes at the mouth of Spuyten Duyvil Creek. These Indians were a sub-tribe of the Wappingers or Wapanachki called the Reckgawawancs."¹ This name seems to have been given to the Indians who inhabited Manhattan Island, while the term *Manhattans* as already stated was a classification of dialect only. Ruttenber says that the Reckgawawancs were named after their chief Rechgawac;² and the name also seems to have been applied to part of the island for Riker says that,—“The Indians still [in 1669] laid claim to portions of the Harlem lands, . . . one of the tracts being their old and favorite haunt Rechewanis, or Montagne’s Point. The chief claimant was Rechewack, the old Sachem and proprietor of Wickquaskeek, who, as far back as 1639, had been a party to the sale of Ranachqua and Kaxkeek.”³

Not much is known of their habits and customs beyond what has been inferred from the relics to be seen in this exhibit, but Mr. Bolton writes:

“We are not without detailed description of our primeval predecessors upon the island of Manhattan, for the Hollanders recorded many of their impressions of aboriginal peculiarities. We may assume that they possessed the usual characteristics, the stolid demeanor, the crafty methods, and revengeful nature of the Indian, all of which were exhibited in their dealings with the White intruders. These local bands appear to have had, in addition, some particular local habits. They painted their faces with red, blue, and yellow pigments, to such a distortion of their features, that, as one sententious Dominic expressed it, ‘They look like the devil himself.’ Their dependence on supplies of game and fish caused their removal from one place to another, semi-annually, and we read of their removal to a summer ‘hunting-ground’ in Westchester, whence the band returned to ‘Wickers Creek,’ for the winter shelter, and to resume their occupation of oystering and fishing in the Harlem and Spuyten Duyvil Creek.

“As for dress, ‘They go,’ said Juet, ‘in deerskins, loose well-dressed, some in mantles of feathers, and some in skins of divers sorts of good fures. They had red copper tobacco pipes, and other things of copper they doe weare about their neckes.’

“No copper objects have been found in upper Manhattan, probably their metallic stock was bartered away with the early colonists, for in 1625, De Laet described their use of ‘Stone pipes for smoking tobacco.’

“As regards their food, the evident abundance and size of the local oyster shells shows that they possessed in them a ready source of subsistence. As soon as Hudson’s ship reached the neighborhood of Greenwich, where the

¹ *Ibid.*, p. 46.

² Ruttenber, *op. cit.*, p. 78.

³ *History of Harlem*, p. 287.

Indian Village Sappokanikan was located, the natives 'brought great store of very good oysters aboard, which we bought for trifles.' De Laet (1625) says, 'their food is maize, crushed fine and baked in cakes, with fish, birds and wild game.' Van der Donck and others wrote in 1649:

Their fare, or food, is poor and gross, for they drink water, having no other beverage; they eat the flesh of all sorts of game that the country supplies, even badgers, dogs, eagles and similar trash, which Christians in no way regard; these they cook and use uncleansed and undressed.

Moreover, all sorts of fish; likewise, snakes, frogs and such like, which they usually cook with the offals and entrails.

They know also, how to preserve fish and meete for the winter, in order then to cook them with Indian meal.

They make their bread, but of very indifferent quality, of maize, which they also cook whole, or broken in wooden mortars.

The women likewise perform this labor, and make a *apa* or porridge called by some, *Sapsis*, by other, *Duundare*, which is their daily food, they mix this also thoroughly with little beans, of different colors, raised by themselves; this is esteemed by them rather as a dainty than as a daily dish.

"Their weapons were, of course, the usual aboriginal bow, arrow, spear, club and tomahawk, though but a few years later, they had acquired from the settlers enough fire-arms to become exceedingly expert in their use. 'Now, those residing near, or trading considerably with the Christians, make use of fire-locks and hatchets, which they obtain in barter. They are excessively fond of guns; spare no expense on them, and are so expert with them, that in this respect they excell many Christians.' Many of their discarded neolithic weapons have been found, and these exhibit a wide variety of material and workmanship, indicating considerable acquisitions from other tribes and localities. Their household utensils included 'mats and wooden dishes,' and Juet refers to their 'pots of earth to dresse their meats in,' and speaks also of the women bringing 'hempe.' The character of the grass mats which the women wove is to be seen in the imprints made with such material upon the outer surface of some of the local pottery. They also made the grass baskets, often referred to in early records, as 'napsas.' The pots of earth were the large earthenware vessels made by the Indian women, on the decorations of the rims and upper portions of which these poor creatures expended all their ingenuity and sense of art.

"Of these objects, there remain a number of interesting examples discovered in upper Manhattan, the most complete, and at the same time, most artistic, being the fine Iroquoian vessel discovered by Mr. W. L. Calver, on the south side of 214th Street, about 100 feet east of 10th Avenue, in the fall of 1906. The large vases found in broken condition in the cave at Cold Spring, are of the cruder and therefore, earlier design of the original

Algonkian inhabitants, who at a later period, probably by barter, and perhaps by inter-marriage, acquired or learned the art of Iroquoian design and decoration.

"Of the period during which the race occupied this locality, we can only make conjectures. The extent and character of the shell heaps at Cold Spring and the pits and burials at Seaman Avenue, certainly indicate a settlement of large numbers or of considerable age. The ceremonial pits at 212th Street and certain remains of aboriginal feasting, such as fish bones and oyster shells, appeared to exist at a level below the graves of the slaves of the settlers, buried at that place.

"While these conjectures may carry back the period of occupancy to antiquity, the tools and weapons are all of the modern order, and no objects of true paleolithic character have been discovered, so that we have as yet nothing definitely reaching back into the remote ages of the most primitive mankind, although on Hunt's Point in the Bronx, at no great distance away from our island, a very interesting rude ax and a hammer were discovered by Mr. Calver in a gravel-pit, near the old Hunt burying-ground."

LOCATION OF ARCHÆOLOGICAL REMAINS ON MANHATTAN ISLAND.¹

The first field work done on Manhattan Island is of very recent date. Doubtless many articles of Indian manufacture and evidences of Indian occupation were found as the city grew up from its first settlement at Fort Amsterdam, but of these specimens we have very few records. The first specimens found which have been preserved, to the knowledge of those now interested in the subject, were found in 1855, and consisted of a deposit of Indian arrow-points found in Harlem during excavation for a cellar on Avenue A, between 120th and 121st Streets. Some of these are spoken of by James Riker² as being in the author's cabinet. Riker also speaks of shell heaps near here.³ The next specimens preserved were found at Kingsbridge Road (now Broadway) and 220th Street in 1886, and are in the John Neafie collection at the Museum. These consist of an arrow point and a few bits of pottery. The next work was begun in 1889 by Mr. W. L. Calver of this city, and has led to the discovery of much valuable material which has been preserved.⁴

¹ By James K. Finch.

² History of Harlem (1881), footnote, p. 137.

³ Ibid., p. 366.

⁴ In the Spring of 1890 Mr. Edward Hagaman Hall began his investigations and at about the same time Mr. Reginald P. Bolton entered the field of local research. In many instances these gentlemen and Mr. Calver collaborated with valuable results. In the preservation of the traces of Indian occupation of Manhattan Island the American Scenic and Historic Preservation Society (formed in 1895 under the presidency of the late Hon. Andrew H. Green, but now under that of Dr. George Frederick Kunz) has done much pioneer work.

EDITOR.

The following account of the work is taken mainly from Mr. Calver's note-book:

In the autumn of the year 1889, while exploring the heights of Bloomingdale (now called Cathedral Heights) for any relics that might have remained from the Battle of Harlem, Mr. Calver discovered one arrow point at 118th Street, east of Ninth Avenue, and immediately afterwards a circular hammerstone. On a later trip to the same locality, he found a small grooved axe or tomahawk.¹ In February, 1890, while hunting for Revolutionary relics in the vicinity of Fort Washington, he made a trip to the northern part of the Island in search of British regimental buttons, many of which were said to have been found in that vicinity. There he met an old acquaintance, Mr. John Pearce, a policeman then on duty there, by whom he was introduced to Mr. James McGuey, a youth residing in the vicinity of 198th Street and Kingsbridge Road. To Mr. Calver, Mr. McGuey presented several relics found by himself on camp sites and made an appointment to meet him early in March to explore for Indian remains. The same day, Mr. Pearce took Mr. Calver to be introduced to Mr. Thomas Reece who resided near Kingsbridge Road and Isham Avenue, and, while crossing the orchard at Academy Street and Seaman Avenue, Mr. Calver saw that the ground was thickly strewn with shells which afterwards proved to be of Indian origin.

The first Sunday in March, Messrs. Calver and McGuey explored this part of the Island for Indian remains. At the junction of Academy Street and Prescott Avenue, they found an Indian potsherd whose importance Mr. McGuey seemed to realize, for, a week later, Mr. Calver met him again and was presented by him with a number of fragments of Indian ware. He assured Mr. Calver that he had found it by digging in an Indian graveyard. The two men dug again at this place, now known as "the Knoll," and found more pottery. They then went to Cold Spring, a point on the extreme northern end of the Island, and in a shell heap there they found more Indian work. Mr. Alexander C. Chenoweth, an engineer, then on the Croton Aqueduct, hearing of these discoveries, obtained a permit from the property owners and began to explore "the Knoll" for Indian remains. Having finished here, he went to Cold Spring and made some further discoveries. All his specimens were purchased in 1894 by the Museum, and some of them are now on exhibition.

Since this time, several interesting relics have been found and, as the work of grading streets and other excavation at this part of the Island are carried on, more relics will probably come to light. An account of the recent finds will be found in another part of this Guide, the time of this writing having been 1904.

¹ The writer found an arrowhead on South Field, in front of Columbia University Library, on September 30, 1904.

The only Indian remains left on the Island, so far as known to the writer, are situated at the extreme northern end at Inwood and Cold Spring. They consist of the co-called shell heaps or refuse piles from Indian camps, and three rock-shelters at Cold Spring. But we have evidence to show that this was not the only part of the Island occupied by the Indians. Mrs. Lamb¹ says that the Dutch found a large shell heap on the west shore of Fresh Water pond, a small pond, mostly swamp, which was bounded by the present Bowery, Elm, Canal and Pearl Streets, and which they named Kalch-Hook or shell-point. In course of time, this was abbreviated to Kalch or Collect and was applied to the pond itself.² This shell heap must have been the accumulation of quite a village, for Mrs. Jno. K. Van Rensselaer³ speaks of a castle called Catiemuts overlooking a small pond near Canal Street, and says that the neighborhood was called Shell Point. Hemstreet refers to the same castle as being on a hill "close by the present Chatham Square," and says that it had once been an "Indian lookout."⁴ Excavations at Pearl Street are said to have reached old shell banks. "The Memorial History of New York"⁵ says that a hill near Chatham Square was called Warpoes, which meant literally a "small hill."⁶ According to the same authority, "Corlear's Hoeck was called Naig-ia-nac, literally 'sand-lands.' It may, however, have been the name of the Indian village which stood there, and was in temporary occupation." This is the only reference we have to this village, but there are references to another on the lower end of the Island. Janvier⁷ says that there was an Indian settlement as late as 1661 at Sappokanican near the present Gansevoort Market. According to Judge Benson,⁸ Sapokanican was the Indian name for the point afterwards known as Greenwich. "In the Dutch records references are made to the Indian village of Sappokanican; and this name... was applied for more than a century to the region which came to be known as Greenwich in the later, English, times. The Indian village probably was near the site of the present Gansevoort Market; but the name seems to have been applied to the whole region lying between the North River and the stream called the Manetta Water or Bestavaar's Kill."⁹ Benton says that the name of the

¹ History of New York City, p. 36.

² Mr. Edward Hagaman Hall, however, derives the name from "Kolk" or "Kolch" a word still in use in Holland and applied to portions of a canal or inclosure of water. The word also means "pit hole", which aptly describes the Collect Pond.

EDITOR.

³ Goede-Vrouw of Manahata, p. 39.

⁴ Hemstreet, Nooks and Corners of Old New York, p. 46.

⁵ Bulletin, N. Y. State Museum, Vol. 7, No. 32, p. 107, Feb., 1900.

⁶ James G. Wilson, op. cit., p. 52.

⁷ Evolution of New York.

⁸ N. Y. Historical Society Collection, S. II, Vol. II, Pt. I, p. 84, 1848.

⁹ Thos. A. Janvier, in Old New York, pp. 85-86.

village was Lapinican.¹ Going back to the old Dutch records might lead to finding the actual names and other data regarding these places.

Most of the specimens found on Manhattan Island, as already stated, come from the northern part. We have a few from the central portion, however. There are the arrow-heads spoken of by Riker, and in Webster Free Library there is a fine specimen of a grooved stone axe found at 77th Street and Avenue B. Mr. Calver has found an arrow-head at 81st Street and Hudson River and specimens from the site of Columbia College have been recorded.

Doubtless the northern part of the Island was inhabited for the longer period; but it is probable that all along the shore, wherever one of the many springs or small brooks, shown on old maps, emptied into the Hudson or East River, there were small, temporary Indian camps. It is likely that these camps were used only in summer, while the primitive occupant of Manhattan retreated to the more protected part of the Island, as at Inwood and Cold Spring, during the winter. Or it may be possible that, as Ruttenber² states, the villages on Manhattan Island were only occupied when the Indians were on hunting and fishing excursions, while their permanent villages were on the mainland. Bolton,³ however, says their principal settlement was on Manhattan Island.

Fort Washington Point. There is a small deposit of shells, on the southern edge of the point, in which the writer found some small pieces of pottery and a few flint chips, thus proving its Indian origin. This was probably a summer camp, as it was too exposed for winter use.

The Knoll. "The Knoll" was the name applied to a small rise of land, at the southwest corner of Dyckman Street and Sherman Avenue, which ran out into Sherman Creek from the eastern edge of the hill at that place. As already stated, Messrs. Calver and McGuey found potsherds here; then Mr. Chenoweth obtained permission of the property owners to make excavations. He found numerous fragments of arrow points and pottery in some refuse deposits from an Indian camp and also uncovered what were thought to have been "paved fireplaces." The newspapers of the time had accounts of the finds, with pictures of the pottery and other objects found.⁴ Mr. Chenoweth also uncovered a number of skeletons. It is stated that these graves were marked with rough headstones, and there are pieces of a coffin from here in the Terry collection in the American Museum, as are also a number of lead buttons found with one interment. Everything seems

¹ New York, p. 26.

² Indian Tribes of Hudson's River, p. 78.

³ History of Westchester County, p. 25.

⁴ New York Herald, January 14, 1894; also Illustrated American, September 19, 1901.

to point to these as being burials of early settlers, but Mr. Chenoweth holds that they are Indian. Several of the skeletons have been preserved in the Museum. A parallel condition to this at the Knoll was found at 211th Street and will be spoken of later. The Knoll site had undoubtedly been an ancient Indian camp. Probably Sherman Creek was open up to this point to Indian canoes.

Cold Spring. Cold Spring is situated at the extreme northern end of Manhattan Island on the southern shore of Spuyten Duyvil Creek. The Indian remains consist of three rock-shelters and three refuse heaps. The rock-shelter is a formation where the overhanging rocks form a small cave or shelter which the Indians used as a dwelling place. All their rubbish, such as oyster shells, broken pottery and broken arrow heads, were dumped near by, forming the so-called shell heaps. Messrs. Calver and McGuey explored the shell heaps; but Mr. Chenoweth was the first to suspect the existence of the shelters. There is only one which is likely to have been used as a dwelling place, the others being places where food was stored or shelters for fires used in cooking. These shelters face east, and are at the foot of the hill (formerly called Cock Hill) which forms the most northern part of Manhattan Island. The largest one was formed by several of the rocks breaking off the cliffs above and falling in such a manner that, by digging out some of the earth from beneath them, the Indians could make a small shelter. Probably it was occupied by one family, while the others lived in bark wigwams near by.¹ Another of the shelters is simply an excavation under the end of a huge fragment which also dropped from the cliffs above, and the third is a large crevice in the foot of these cliffs. When Mr. Chenoweth first explored them, all these shelters were completely filled with earth which had gradually worked its way in since their occupation, and much credit is due him for suspecting their presence. In them he found fragments of pottery and stone implements, together with the bones of turkey and deer. The largest of the refuse heaps is situated on a rise directly in front of these shelters. It consists of a layer of shells, in places several inches thick, found under a layer of fine loam, a black earth which has been deposited since the shells were scattered over the original sandy yellow soil. The sheltered position of this place made it an especially desirable camp site. The hills to the south and west formed a protection to the camp from winds, and by Spuyten Duyvil Creek access could be had to either Hudson or East River; while the Cold Spring, from which the place takes its name, furnished an abundant supply of fresh water.

¹ Memorial History of New York, Vol. I, p. 33, for picture of houses, and p. 39 for description.

Inwood Station Site. At the foot of Dyckman Street and Hudson River, there existed a large deposit of shells, most of which were removed when the rocks on which they lay were blasted away for grading the street. A few arrow points and bits of pottery, as well as several Revolutionary objects, were found here. Part of the deposit is still left on the northern shore of the small bay just below Inwood station. There are photographs of this deposit in the Museum.

Harlem Ship Canal. Formerly at 220th Street and Kingsbridge Road was a large deposit of shells on the westerly side of the road. This was destroyed when the ship canal was put through. As with the Inwood Station site, no systematic examination of this place was ever made. Mr. John Neafie found some potsherds here in 1886, and Mr. Chenoweth also has some potsherds from here.¹ Mr. Calver says that this was a large deposit, and that the peculiar thing about it was that the shells were so wedged and packed together that a pick would hardly penetrate them. They lay on the bare rock surface in cracks in the rock.

Harlem River Deposit. Mr. Calver says, "Extending from 209th Street to 211th Street on the west bank of the Harlem River and almost on a line with Ninth Avenue was another large deposit of oyster shells lying just beneath the top soil of the field. These shells had nearly all been disturbed by the plow and are interesting only for their color, which was red. Pieces of horn of deer and split bones of the same animal were common among the shells; but, in spite of the apparent antiquity of the deposit, there were, even in the lowest strata of it, some small fragments of glass which proved that either the whole mass had been disturbed or else the shells had been left during the historic period. There are several stone sinkers and hammerstones from this spot in Mr. Calver's collection and at the Museum.

Isham's Garden. This is a large garden about on the line of Isham Street and Seaman Avenue. The soil is white with small fragments of shells. A number of arrow points, flint chips, hammerstones, sinkers and a few bits of pottery have been found here. Mr. Calver has found several shell pockets with small deposits of pottery, etc., on the hill to the south of this garden.

Academy Street Garden. This is a small garden between Academy and Hawthorne Streets, running through from Seaman Avenue to Cooper Street. It was a British camp site during the Revolution, and a number of buttons, gun-flints and bullets have been found there as well as numerous Indian remains. It seems to have been the workshop for a red jasper-like stone of which numerous chips but no finished implements have been found. The shells at this point were first noticed by Mr. Calver in 1890. They may not all be of Indian origin, as some may be due to soldiers.

¹ John Neafie collection, 20-2558; Chenoweth, 20-3498.

Dog Burials found in 1895. In January, 1895, Mr. Calver found two interesting "dog burials." The first burial was unearthed at the summit of a ridge of soft earth at 209th Street, near the Harlem River. The ridge, which was about twelve feet high, had been partly cut away for the grading of Ninth Avenue. It was at the highest part of the hillock that a pocket of oyster and clam shells was noticed, from which a few fragments of Indian pottery which lay on the face of the bank had evidently fallen. The shells, upon inspection, were found to have served as a covering for the skeleton of a dog or wolf. Another burial was found on May 18th within fifty yards of the first burial. It had been covered with shells just as the first one, but had been disturbed by workmen. Mr. Calver says: "The two canine burials were situated at a point just without the borders of the Harlem River shell heap and were distinct from it. The shells were found to be matched, hence it was concluded that they were thrown in unopened or eaten on the spot. As the skeletons were intact and the bones uninjured, all probability of the animals having been eaten is disposed of." These burials are common in this vicinity. No satisfactory explanation of them has been given; but Mr. Calver thinks they were for some religious purpose, and suggests a relation to the "White Dog Feast" of the Onondaga of this State.¹ It is certain that the pockets were in many cases used as fireplaces.

Shell Pockets at 211th Street. In March, 1903, there was considerable excitement over the reported discovery of an Indian graveyard at 211th Street.² The graveyard proved to have been that of some slaves, and was situated on the western end of the rise between 210th and 211 Streets, on the eastern end of which is the old Neagle Burying Ground. This discovery was interesting because under the negro graves several shell pockets of undoubted Indian origin came to light. The workmen, in grading Tenth Avenue, cut into this hill to obtain material for filling, and uncovered the graves and pockets. It seems almost certain that the deposits were made some time ago; then the wind blew the sand over the deposits to a depth of four or five feet, and negroes later used this place as a burial ground. In support of this theory is the fact that the pockets were four or five feet under the surface, that the soil above showed no signs of having been disturbed, and that this rise is put down on the Government maps of this section as a sand dune.³ During the summer of 1904, Mr. Calver with Messrs. Hall and Bolton uncovered nine more pockets to the southwest of the graveyard.⁴ These pockets all seem to have been of the same period as the others, and

¹ N. Y. Herald, May 26, 1895.

² Evening Telegram, March 14, 1903.

³ New York Geologic Folio.

⁴ New York Tribune, Oct. 30, 1904, and New York Sun, Dec. 14, 1904.

all appear to have been on the original ground surface, although those farther up the hill were some four feet under the present surface. In one of these pockets, was found the complete skeleton of a dog¹; in another, a turtle shell; two others contained complete snake skeletons; while a fifth held the fragments of a small pottery vessel. The pockets were small, being about three feet in diameter and of equal depth, showing no signs of having first been used as fire places and then filled up, though charcoal was scattered among the shells. Almost all the relics from Van Cortlandt Park were found by Mr. James in pockets similar to these.

During Indian troubles in 1675, the Wickquaskeeks at Ann's Hook, now Pelham Neck were told "to remove within a fortnight to their usual winter quarters within Hellgate upon this island." Riker says, "This winter retreat was either the woodlands between Harlem Plains and Kingsbridge, at that date still claimed by these Indians as hunting grounds, or Rechawanes and adjoining lands on the Bay of Hellgate, as the words 'within Hellgate' would strictly mean, and which, by the immense shell-beds found there formerly, is proved to have been a favorite Indian resort."² A little later the Indians asked to be allowed to return to their maize lands on Manhattan Island and the Governor said that they, "if they desire it, be admitted with their wives and children, to plant upon this Island, but nowhere else, if they remove; and that it be upon the north point of the Island near Spuyten Duyvel."³

Mrs. Mary A. Bolton Post, in writing to the editor of "The Evening Post," June 19th of the year of the opening of the Harlem Ship Canal (1895), speaks of some Indians who were allowed to camp on the south side of Spuyten Duyvil Creek on the Bolton property in 1817. Ruttenber says that the Reckgawawanos had their principal village at Yonkers, but that on Berrien's Neck (Spuyten Duyvil Hill) was situated their castle or fort called Nipinichsen. This fort was protected by a strong stockade and commanded the romantic scenery of the Papirinimen, or Spuyten Duyvil Creek, and the Mahicanituk (Hudson River), the junction of which was called the Shorackappock. It was from this castle that the Indians came who attacked Hudson on his return down the river.⁴ Some small shell deposits occur on Spuyten Duyvil Hill, but as yet this "castile" has not been definitely located. The village site at Yonkers, according to Mr. James, is now covered by buildings; but several relics found near the site years ago are now in the Manor Hall at that place (1904).

¹ All that could be saved of this skeleton has been presented to the Museum by Mr. Edward Haganan Hall.

² History of Harlem, p. 366.

³ Ibid., p. 369.

⁴ Ruttenber, pp. 77-78.

Judging from these references, we might conclude that the territory occupied by the tribe commonly known as Manhattans included Manhattan Island and that part of the mainland which is west of the Bronx River north to Yonkers, and that these Indians were a sub-tribe of the Wappinger division of the Mahican.

Indian Burials.

Indian Burials. Notwithstanding all the efforts of various collectors, the first Indian burials to be discovered on the Island were due to the activities of Messrs. Bolton and Calver in 1904. The improvement of Seaman Avenue, Upper Manhattan, at that time, uncovered many relics of the long extinct Indian inhabitants among which Mr. Bolton saw unmistakable signs of Indian graves. To quote from this gentleman: "It thus became evident that there were human interments in the vicinity, and in August, 1907, the first burial was discovered under a shell pit in Corbett's garden. The grading process had been extended only about eighteen inches below the sod, but had sufficed to destroy the jaw of the skeleton which extended upwards, as did also the foot bones. The bones lay in and upon a close mass of oyster shells, some of which were unopened, the skeleton reclined on its right side, facing west. The arms were flexed and crossed, the knees bent and the head thrown back. No traces of weapons were found, nor were there any other objects found, save a fragment of an animal bone.

"The location and position led to further exploration, which, early in 1908, led to still more interesting discoveries. Sunday, March 22nd, being the first day in the field for exploration for the season for 1908, W. L. Calver and the writer met at Seaman Avenue and Hawthorne Street, Manhattan, to discuss plans for further excavations on this Indian village site. The rains of the winter 1907-8 had washed the west bank where the layer of oyster shells and black dirt lay along the hill, and a patch of red burnt earth was observed, which on digging out, disclosed a fireplace, evidently of the period of the Revolution, having some large burnt stones, ashes, wood charcoal, brick, broken rum bottles, a wine glass nearly complete, a large open clasp-knife with bone handle, a hoop-iron pot-hook, various forged head nails and a curious folding corkscrew. Gold buttons of Revolutionary pattern and an officer's silver button of the Royal Mariners, together with pewter buttons of the 17th Regiment disclosed who had occupied the spot.

"At one part of this fireplace, we came upon a pocket of oyster shells, evidently Indian, about two feet deep, and on removing some of these, had the good fortune to uncover a human thigh-bone. We worked carefully

into the shells and under the pocket, gradually disclosing the complete remains of a full-grown man (Fig. 19) lying on its right side, feet to the north, head facing east, knees doubled up, the left arm extended down through the thighs. The feet had been within the area of the hole in which the Revolutionary fireplace had been made, and only one or two foot bones were found. At a later period other foot bones were found on the opposite side of the Revolutionary fireplace, evidently having been displaced in its construction. The right arm was flexed, and the hand was under the head, the latter was



FIG. 19. INDIAN BURIAL, MANHATTAN.

intact and every tooth was in place. Shells had been packed over the body, and some around it. We were much puzzled by a number of human bones, lying compactly together by the skeleton, in a position that would have been in its lap had it been upright.

"We removed the skull, covered the remains, and on Sunday, March 29th, renewed the work. We went carefully to work upon the cluster of mixed bones in front of the large skeleton, and soon found them to be rather compactly arranged in a rectangular form about 14 by 26 inches, the long bones parallel. The vertebræ abruptly ended parallel with the head of the larger skeleton, and after working some time, we found a skull placed below, beneath the pile of bones in a vertical position, facing north, the

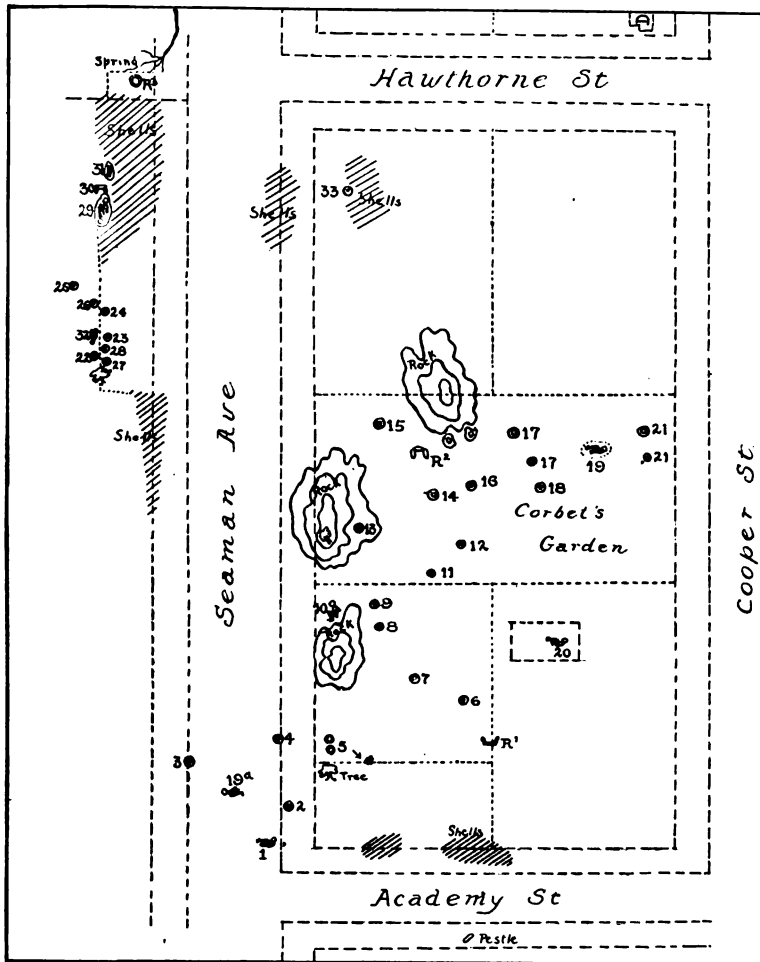


FIG. 20. LOCATION OF BURIALS, PITS AND SHELL-BEDS NEAR INWOOD.

1. Human remains. 2. Shell pit, deer antler. 3. Shell pit. 4. Shell pit, pottery. 5. Shell pits. 6. Shell pit, sturgeon below. 7. Shell pit, sturgeon scales. 8, 9. Shell pits. 10. Human remains. 11. Fire pit. 12. Shell pit. 13. Dog burial, puppy. 14. Shell pit. 15. Part of a jar. 16. Shell pit, fish and meat bones. 17. Shell pits. 18. Two dogs in shell pit. 19. Human skeleton, 1907. 19a. Female skeleton, 1908. 20. Human remains when house was built. 21. Small fire pits, Revolutionary. 22. Large shell pit. 23. Large shell pit. 24. Shell pit. 25. Dog burial. 26, 27, 28. Shell pits. 29. Two human skeletons, male and female. 30. Revolutionary fireplace "Royal Mariners" and "17th." 31. Skeleton and infant, female. 32. Skeleton (Chenoweth, 1908). 33. Revolutionary fireplace, 71st, officers' buttons. D. Dyckman dwelling. R¹, R². Revolutionary fireplaces. R³. Revolutionary well.

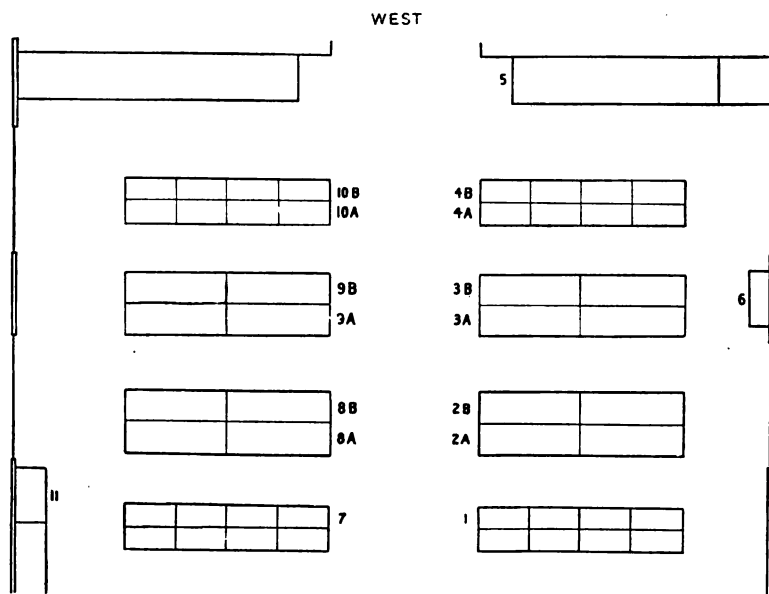
lower jaw of which was disengaged, and was placed sideways in front of the face. The back of the skull was broken in, and was black with marks of burning. The lower jaw was burned, and some of the teeth split by fire. The arm and leg bones were charred at the joints. Inside the skull was a burned toe bone. Some oyster shells were among the charred remains.

"A significant fact was that the right arm bones of the large skeleton were below the pile of burned bones. This feature, and the compact arrangement of the latter within the space in front of and at the same level as the large skeleton, seem to point strongly towards an intentional arrangement of these bones, in front of the large corpse and to indicate the simultaneous burial of the two bodies. On examination, the large skeleton proved to be that of an adult male, and the dismembered remains those of a female of about 35 years of age. No implements were found with the remains, but a part of a stone pestle and a rude celt lay under the sod among the oysters above the large skeleton.

"On Sunday, June 14, 1908, another burial was found about 20 feet north of the above. This burial consisted of an adult skeleton doubled up and its back much curved, and was apparently that of a female of mature age. Between the knees, the remains of a small infant were laid, the skull of the latter being fragmentary. The right hand of the adult was below the infant and the left hand around the throat. The skull was intact and had nearly all the teeth. One finger bone had grown together at the joint in a crooked position apparently due to disease. On lifting the ribs of the right side, an arrow-head of flint fell out between the fourth and fifth bones. These skeletons lay about two and a half feet below the grass, and a pocket of oyster shells was over the head. The woman's remains lay within a space about 31 inches long by 50 inches wide, flat in the hard red sand bed facing east.

"Shortly after these remains were discovered, Mr. Chenoweth extended the excavation previously made by the explorers at the side of a large oyster shell pit in the same bank of sand, and uncovered a male skeleton of which he preserved the skull. Some small fragments of the skeleton were afterwards found by the writer on this spot. Contractors for the sewer in Seaman Avenue also uncovered the remains of a young female close to the position of several of the shell pits previously described.

"These interments have some curious features. The position of the remains facing east, sometimes west, the absence of weapons or other objects and the oyster shells packed with or above them are subjects for interesting discussion on which future finds may throw much light, as also upon the peculiar double burial and the burnt state of the female remains."



FLOOR PLAN, WESTERN END OF THE HALL OF THE PLAINS INDIANS
(No. 102).

EXPLANATION OF CASE NUMBERS.

- 1 Mohegan and Delaware. Iroquois: Clothing; Weapons.
- 2A Prehistoric Life in Greater New York.
- 2B Prehistoric Manhattan Island.
- 3A Shinnecock Hills, Long Island.
- 3B Van Cortlandt Park. Long Island.
- 4A Iroquois: Corn Food; Household Utensils.
- 4B Iroquois: Transportation; Games; Ceremonial Objects; Wampum.
- 5 Iroquois Group.
- 6 Shell Heap.
- 7 Iroquois: False Face Society.
- 8A Westchester County.
- 8B Upper Hudson.
- 9A Kah Kwah and Erie Indians of New York State.
- 9B New York State. Articles of European Manufacture.
- 10A Pottery of Greater New York. Husk Face Society.
- 10B Bolton and Calver Collection.
- 11 Rock Shelter.

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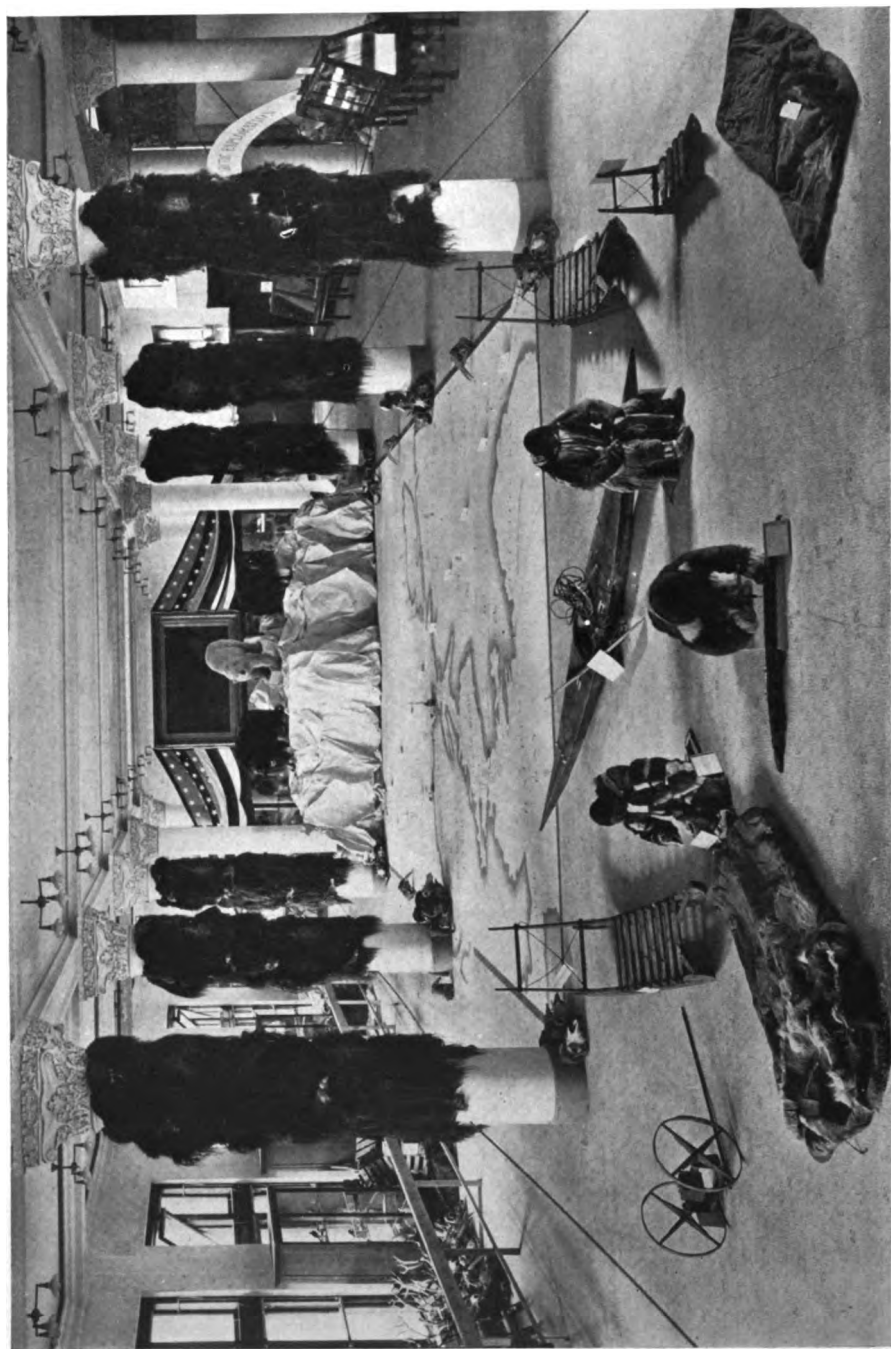
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VOL. IX

NOVEMBER, 1909

No. 7

ACHIEVEMENT IN POLAR EXPLORATION.

THE EXHIBIT OF THE PEARY ARCTIC CLUB.

FOR several years a record of Polar exploration has been on exhibition at the Museum in the east corridor immediately off the main foyer. Here, on two fifteen foot maps painted on segments of a globe fastened to the wall have been indicated the routes of Arctic and Antarctic expeditions.

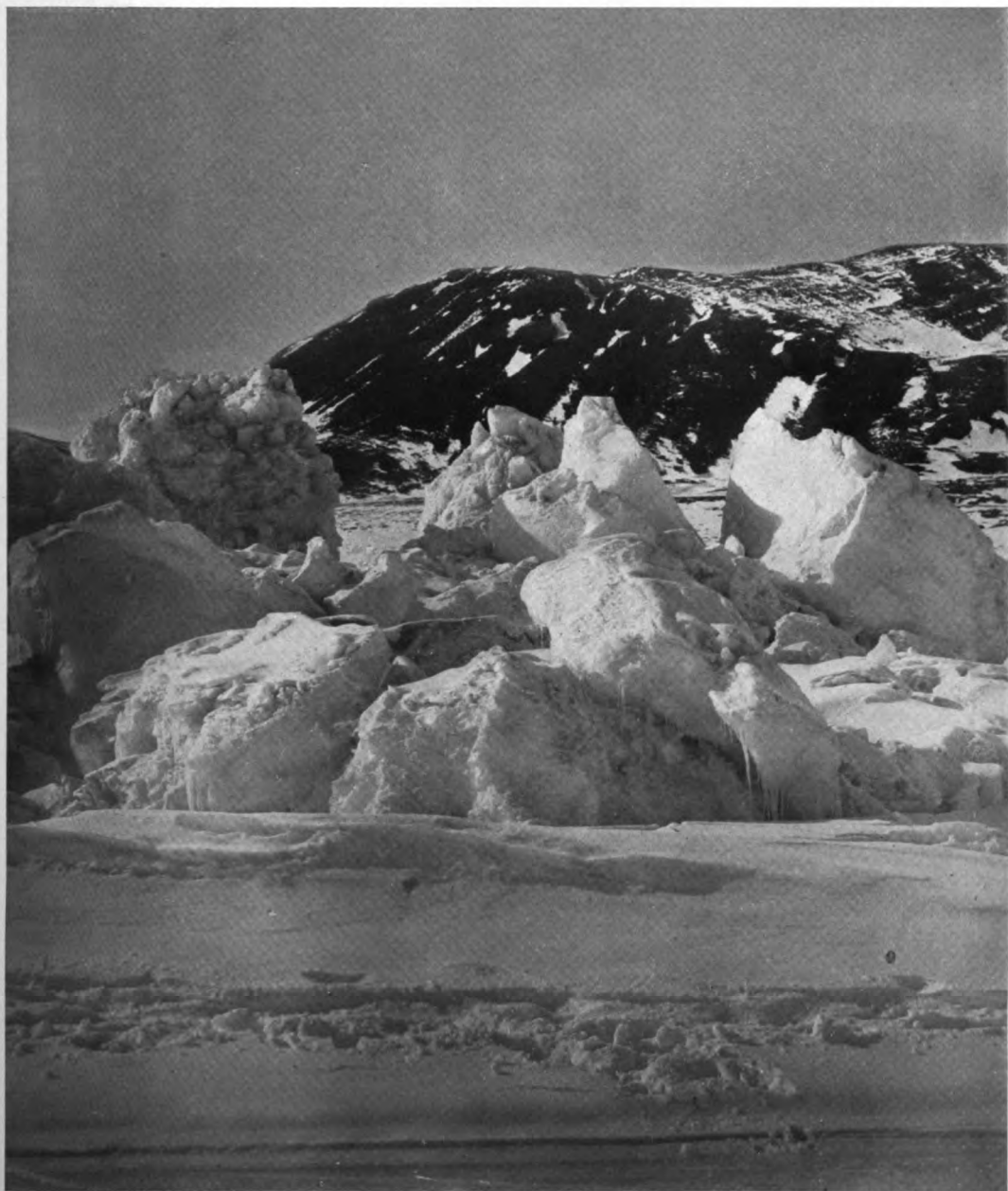
On September 6 the Arctic map showed Nansen's farthest north, $86^{\circ} 14'$, reached in 1895, the Duke of the Abruzzi's (Cagni's) record, $86^{\circ} 33'$, made in 1900, and the northernmost point of all, $87^{\circ} 6'$, gained by Peary on April 26, 1906, but the routes went no nearer the Pole than these points, and from them stretched untraversed a region known to be more than two hundred miles wide on all sides of the Pole. On September 7, 1909, however, the red cord marking Peary's latest expedition spanned this remaining distance and a small flag floated at the center of the Arctic map to bear record to the larger American flag that was left on April 6, 1909, waving over the drifting ice where half the year is day and half is night.

This achievement, striven for by many men of many nations, marks an event in history. It closes a century of Arctic research, which century in turn was the culmination of a period of three centuries of exploration, if we count the exploits of whaling and sealing vessels and the early expeditions in search of a short water-route from western Europe to the Orient. Some facts have been discovered, some things proved not true, and the field is clear for new achievement along other lines, to the end that man may have a fairer understanding of the Universe in which he finds himself.

On the morning of October 12, an exhibition by the Peary Arctic Club was opened in the west wing of the Museum. The presentation

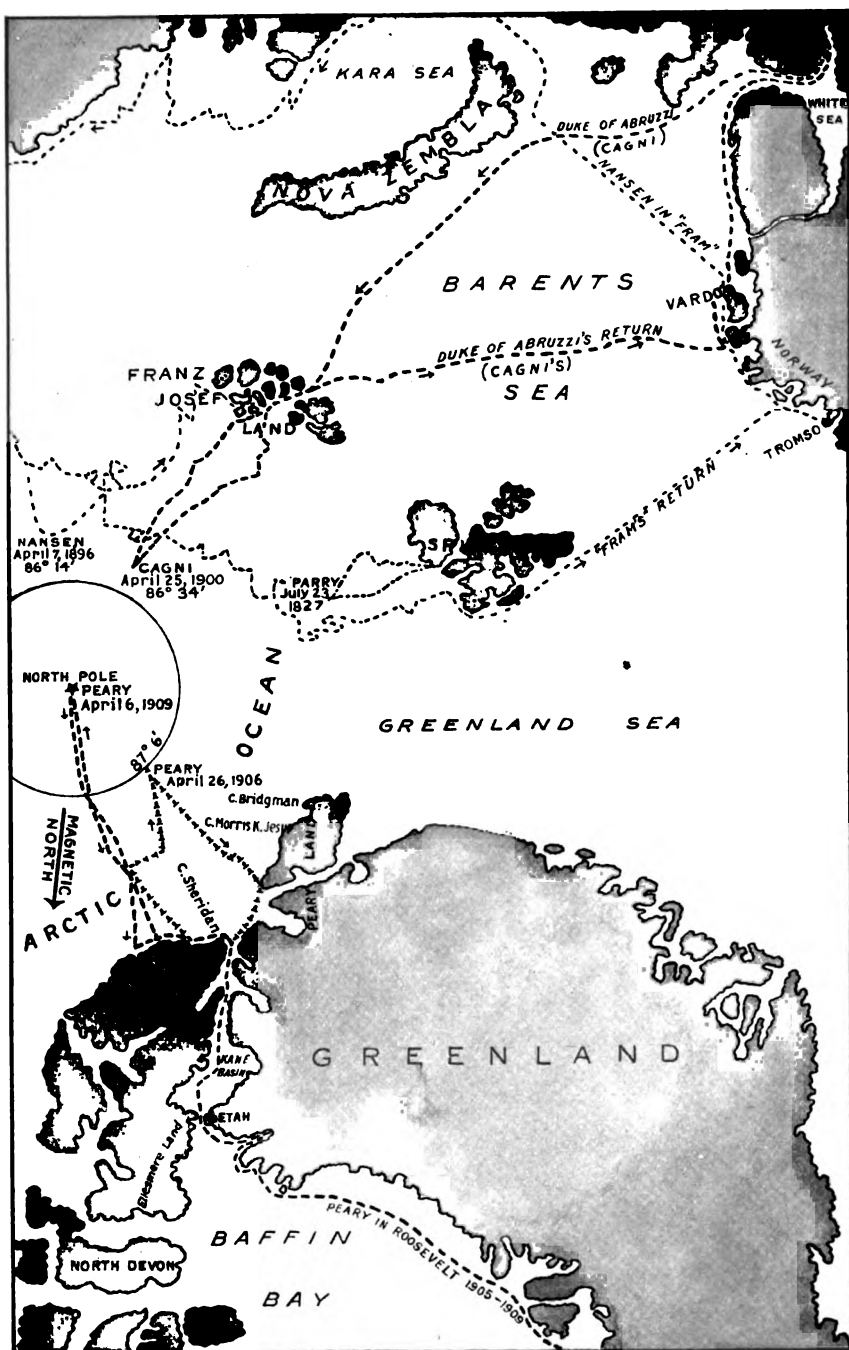
in this exhibit is unusually vivid. A half hour in the hall leaves one imbued with the feeling that he has actually traveled into the untenanted world around the North Pole. In the first place the exhibit is installed to give an effect of simplicity and severity, of much uninterrupted space, cold white surroundings and few objects. Those in charge were careful not to draw on the Museum's well-filled store houses of Arctic materials to such an extent as to destroy this atmosphere of severity. In the second place, because of the nature of the exhibit, everything speaks of adventure, of a difficult life, often of narrow escape and sometimes of disaster. This is true throughout, from the relic of the wrecked "Polaris" — a battered life boat that acts as a sign board just outside the entrance of the hall, to the view of the "Polaris" in 'Thank God Harbor' — an immense canvas at the far end. Every object in the place seems to take on life as a representative of the daring work of some explorer.

In imagination we see the sleeping bags, displayed near the entrance, with their voluminous fur folds wrapped about the traveller shutting out the savage cold. We see the sledges not as mere dead frame-works of wood, but as active aids to man. In our awakened fancy, they have iced runners and, loaded with provisions, they cut deep trails as with dogs and drivers they pass always on into boundless ice and snow. The mounted dog, placed here to illustrate the Eskimo method of harnessing, brings to mind the long double-ranked teams, or the fan-shaped teams of eight as Peary drove them, dragging their burdened sledges, obeying word and whip day after day until too weak to help the expedition longer, except by giving their bodies as food to strengthen their fellows; while those who have read "Northward Over the Great Ice" recall Peary's tribute to the dogs of that journey, "Faithful, noble servitors. . . . My only consolation is the knowledge that like ourselves you did not suffer pain. The starvation was so gradual that when at last your lives went out. . . . the end was painless, as our own would have been had it not been for you." The mounted musk oxen, the many shaggy brown pelts wound about the pillars and the numerous skulls piled upon the floor, bring to mind forcefully the dependence of the explorer upon these animals for food. We get a more vivid understanding of the eagerness with which he has many a time searched the ground for musk ox tracks, and a more keen sympathy with his fear when he saw one or more of the great creatures, that his eyes blinded by



AN EXPLORER'S TRAIL LEFT AT THE ICE FOOT ON THE COAST OF GRINNELL LAND.
Greeley Expedition, May, 1882.





PART OF THE NORTH POLAR REGIONS, SHOWING LINES OF APPROACH FROM AMERICA AND EUROPE.

the incessant glare of the ice would give a false aim at the critical moment.

The realism of the exhibit is increased by the work of a newly-invented automatic stereopticon placed in a darkened alcove at the right of the hall. Through its display of pictures (uninterrupted from nine in the morning until five in the afternoon) the visitor is carried into the heart of the Arctics. He looks on boats and men, sledges and dogs, in action; he sees in these pictures the very mountains and icebergs, the self-same pressure ridges or "rafters" of ice and the leads of open water that the explorer whose hand held the camera saw in reality.

The central and most striking feature of the hall is a map painted in color on the floor over a space 30 feet by 50 feet in dimensions. It presents the approach to the Pole from North America only, the more frequently used of the two principal paths of exploration, namely: the route between Nova Zembla and Franz Josef Island, the direct course from Europe; and that through Davis Straight, Baffin Bay and Smith Sound, a lane of open water stretching northward between Greenland on the east and the line of Arctic American islands extending from Labrador to Ellesmere Land on the west. This map, therefore, does not show the route of Nansen, nor does it give that of the Duke of the Abruzzi, since both of these men made their approach from the Old World. It does mark the points reached by Markham and Parry in 1876, by Greeley in 1881 and by Lockwood and Brainard in 1882. It shows, at Cape Morris K. Jesup and Cape Bridgman, the limit of exploration by Peary in 1900 and marks conspicuously the "farthest north" of the same explorer as reached April 26, 1906. The chief aim of the map, however, is to show the route of Peary's last or eighth expedition, financed by the Peary Arctic Club.

The story graphically spread out on the floor concerns more than a year's time and a distance of 800 geographic miles from Cape York northward to the Pole. The expedition started from Cape York August 1, traveling up Smith Sound. It reached Cape Alexander August 18 and Fort Conger September 2, the latter place being about 500 miles distant from the Pole. At Cape Sheridan the "Roosevelt" remained in winter quarters, as is indicated by the presence of a small model of the boat placed on the map at this point. On March 1, a few days before the sun rose above the horizon after the long Arctic night, the sledge journey began, a journey of more than 400 miles over drifting ice.



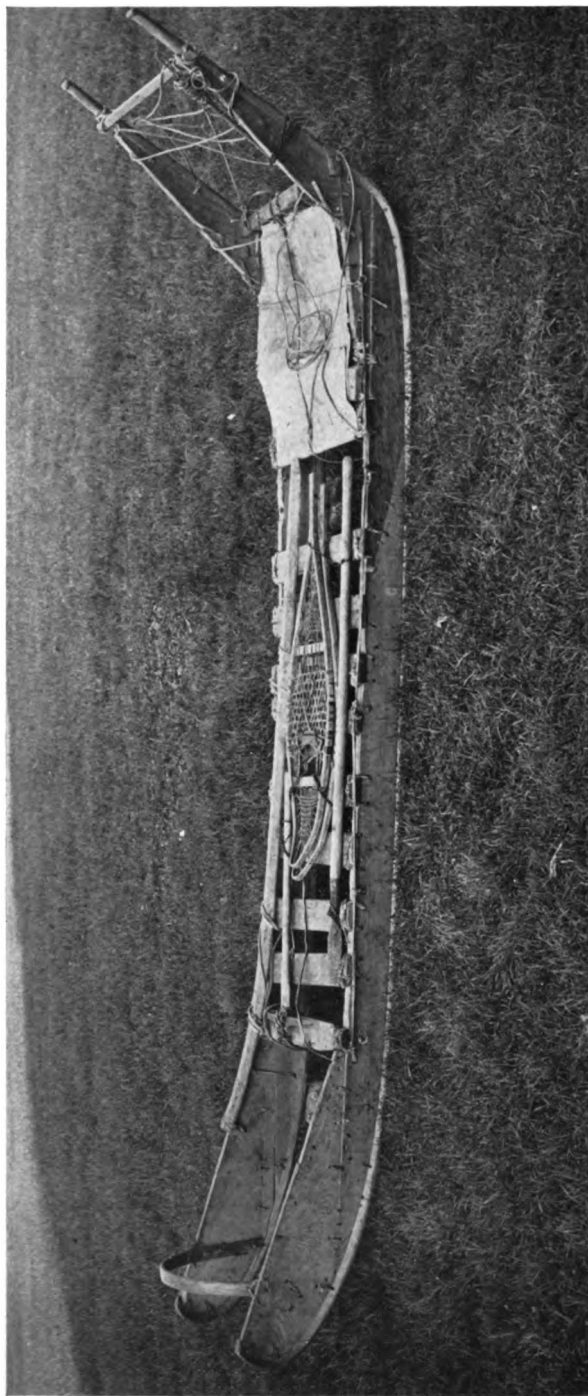
MUSK OX AND POLAR BEAR.

Peary Arctic Club Exhibit.

Through these 400 miles no living thing is to be found, for musk oxen and caribou range no farther north than Cape Morris K. Jesup, the northernmost land, while seal, walrus and narwhal are found only along the waters that margin the land.

The rest of the trip as traced shows a veritable "dash to the Pole." On March 11, 84° north was passed, and a week later, 85° north was reached, 300 miles from the Pole. By March 27 the expedition passed 87° north, and April 2, 88° north, only 120 miles from the Pole and farther north than any human being had ever before penetrated. Only four days later camp was made at the journey's end, and the American flag was flying at 90° north.

There is scarcely anything in the Peary Arctic Club's exhibit outside of this map that attracts more attention than a sledge on the west side



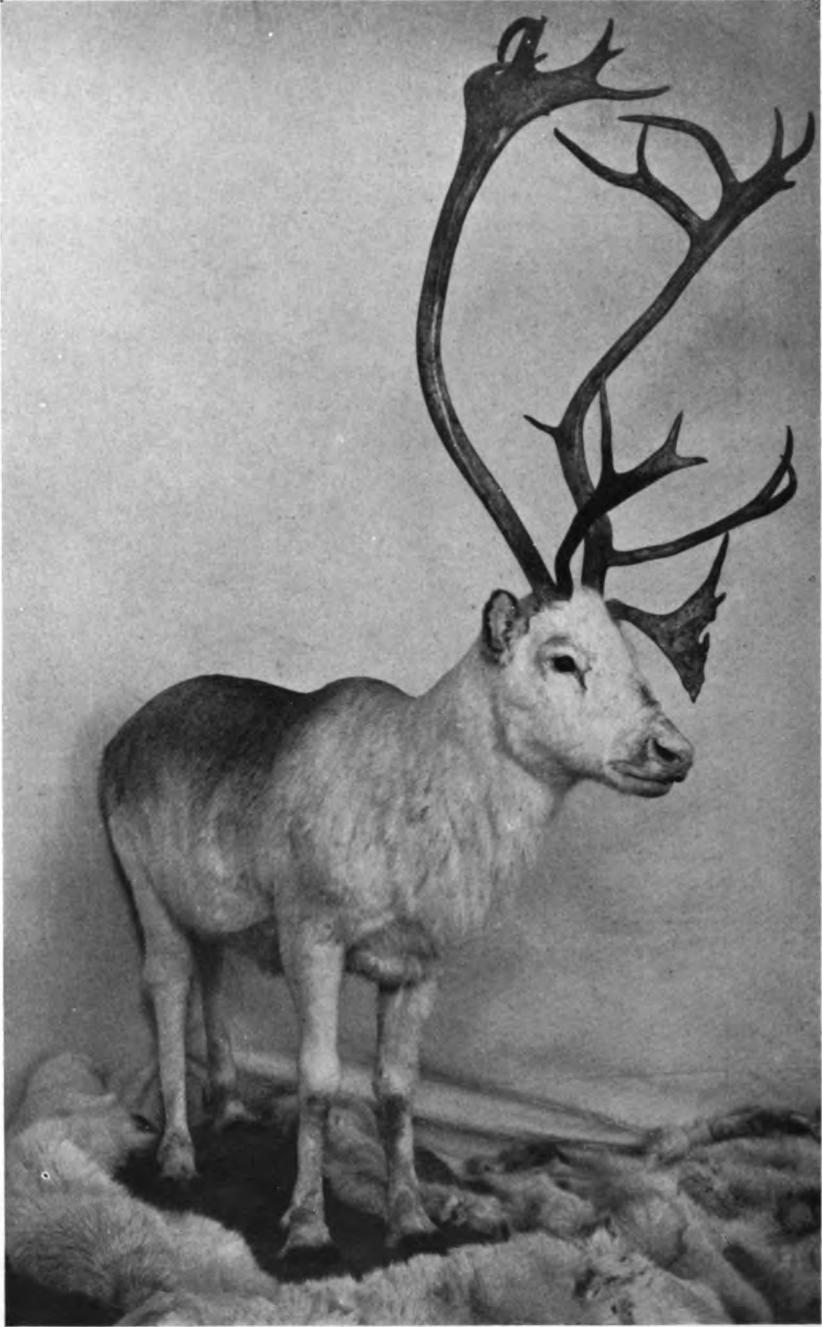
THE "MORRIS K. JESUP", A PEARY SLEDGE THAT REACHED THE NORTH POLE.
Taken on the lawn at the Museum after its return from the Arctic.

of the hall among piles of musk ox, caribou and walrus hides, crates of skulls and antlers, and the many other things that the "Roosevelt" brought south with her stowed away in every available place, even drying in the rigging. Though only a sledge, it seems deserving honor, for it bears this legend "A sledge that reached the Pole." In reality, success has come to Polar exploration through use of the sledge as a means of travel.

Before 1820 ships alone were used. When frozen in, an expedition was delayed until a time of thaw. It was not until the second or third voyage of Parry and the second of Sir John Ross, that is in 1821 and 1834, that sledging expeditions began and the fact was discovered that "ice which arrests the progress of the ship forms the highway for the sledge." Since that time, there has been great advance in sledge construction, in the light of which fact it is interesting to compare the sledges in the possession of the Museum. This sledge that reached the Pole is 12 feet long and 2 feet wide. It consists of two wooden runners curved upward at both ends and wooden slats crossing the runners several inches apart and bound loosely to them by thongs of walrus hide. Light and flexible, it is able to rise and dip through the snow of steep descents without the slightest injury to itself, and has surely proved its fitness for Arctic travel.

The exhibit is instructive as to the manner of maintaining life in the difficult environment of the Arctics. A case is filled with the skins and tools used in igloo building, another contains kayaks, harpoons and various fishing and hunting paraphernalia. From the facts brought out here, we learn the total dependence of the Eskimo on the few animals of the region, particularly the walrus and the seal. Still other cases contain garments of fur,—fur of fox, seal and reindeer. They show also coats made by fastening together many small bird skins.

There is much suggested also in the matter of Arctic travel aside from what has already been noted. One case contains the instruments used in exploration, such as sextant, chronometer and compass, and beside these which tell of the success of science in invention and of exploration in making use of this invention are dramatically placed various crude implements and vessels fashioned by the Eskimo from copper taken from the wreck of Sir John Franklin's ship. An arching label "A Century of Arctic Exploration" calls attention to still other cases containing the many books descriptive of expeditions to the Arctics.



THE PEARY CARIBOU (RANGIFER PEARYI ALLEN).

Peary Arctic Club Exhibit.

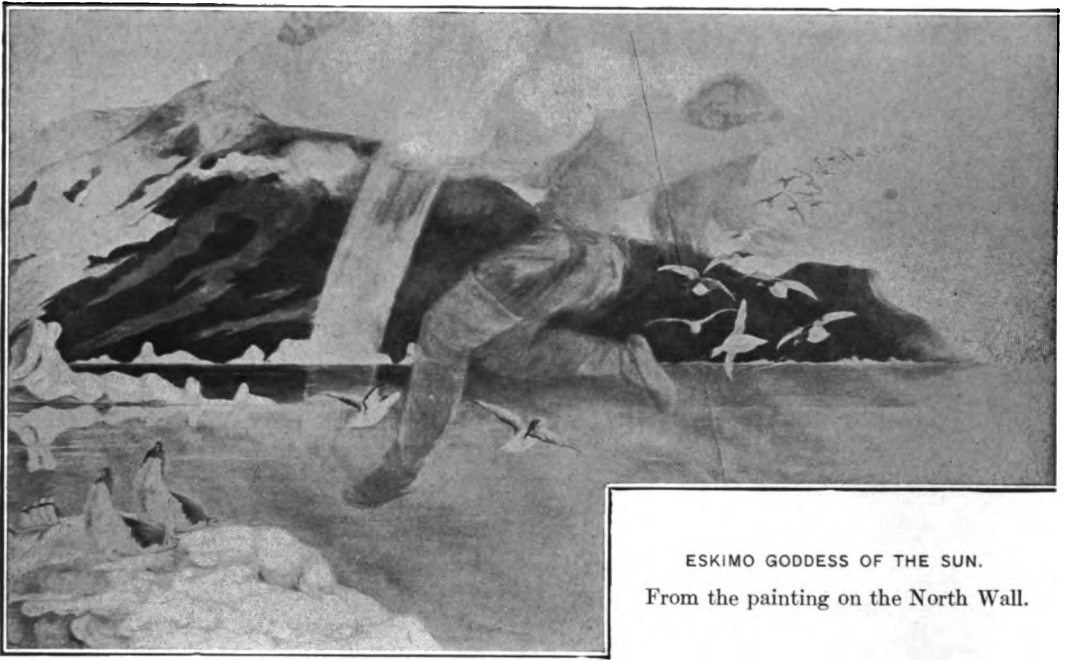
These books lie open at their title pages and, covering the time from the work of Sir John Ross to the present, invite further investigation.

As a whole, the exhibit has a note of triumph in it. There is triumph in the discoveries to science of lands and waters, in the improvement in life for the Eskimo through the intervention of civilized man, in the final direct route that Peary made and the American flag floating above "the top of the world" in the map on the floor. The visitor reads also a greater triumph than these, for one who has heard accounts from the lips of northern explorers or has felt a choking in the throat over the experiences recorded in some of the vivid writings of these same men, realizes the hardship involved in Polar exploration, the years of privation and physical distress, of sacrifice of all that to ordinary mortals makes life worth living. He knows that there has been set before the world an example of what above most things makes life worth living,—the indomitable courage and perseverance that ends in accomplishment.

THE MURAL DECORATIONS OF THE ESKIMO HALL.

THE mural decorations at the northern end of the Eskimo Hall have been painted by Mr. Frank Wilbert Stokes, an artist, who, as member of the Peary Relief Expedition of 1892 and of the Peary North Greenland Expedition of 1893 and 1894, has made careful study of the Eskimo people and their frozen country.

Ranged about the hall below are the weapons, the articles of dress, the boats, the sleds, while above them in this painted frieze these same objects are seen put to use in the daily activities of the Eskimo, revealing his adaptation to an environment of months' long days and nights among glaciers and icebergs. The combination of the scientific exhibits below and the artist's work above, brings home to the observer not only the ethnological facts involved, but also other facts, such as the austerity of Eskimo life, its enforced simplicity and the limitations set upon civilization for the people of the Arctic. Much of the interest of these pictures rests in the fact that many of the scenes represent localities actually visited by the artist. Mr. Stokes established his studio at Bowdoin Bay, 77° 44' N. latitude, and worked there during fourteen months, with the primitive life of the Eskimo and the glowing colors of the northern land under constant observation. As William Walton has said in an article in *Scribner's Magazine* for February, 1909, Mr. Stokes has here succeeded, despite the



ESKIMO GODDESS OF THE SUN.
From the painting on the North Wall.

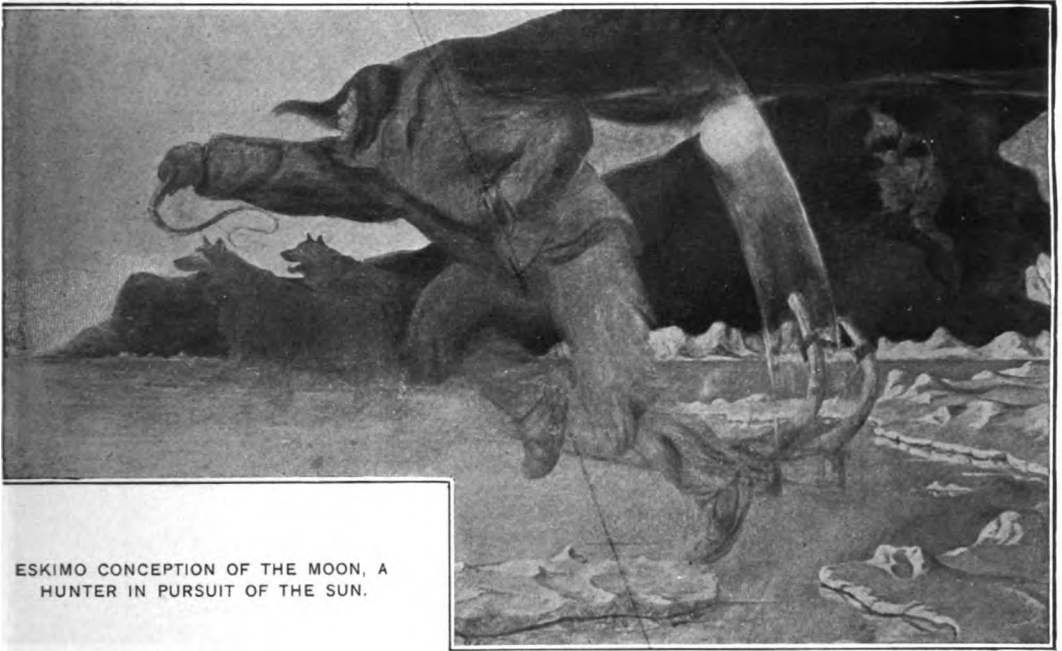
Copyright 1908 by Frank Wilbert Stokes.
Courtesy of Scribner's Magazine.

inadequacy of pigments, in well suggesting "the utmost splendor of light that blazes in the Polar skies and glows in the Polar, translucent ice."

THE NORTH WALL.

The largest picture of the series — in full view from the main foyer of the Museum — is a continuous panorama sixty feet long. It is intense and realistic in its coloring. In the center the glow of a mid-night sun illuminates promontories and sea, toward the right this brilliant color gradually fades to the gray and purple of the twilight that precedes the long Arctic night, while toward the left it changes to the white lights and deep blue shadows of that other twilight that foretells the approach of the long Arctic day.

Against the vivid gold and red of the center of the painting is portrayed the artist's conception of the Eskimo myth of the "Sun and the Moon." There is presented a giant mirage of two figures in full pursuit through the air. These figures are Ahn-ing-ah-neh, a hunter, typifying



ESKIMO CONCEPTION OF THE MOON, A
HUNTER IN PURSUIT OF THE SUN.

Copyright 1928 by Frank Wilbert Stokes.
Courtesy of Scribner's Magazine.

the moon and ushering in the long winter, and Sukh-eh-nukh, standing for the sun, a goddess accompanied by summer and plenty. Ahn-ing-ah-neh is dressed in winter garb and is driving his team of dogs. The lower part of the figure, like the dogs and sledge, are shadowy in the painting, but the upper part reaching forward in the chase, the head and the right arm with its lashing whip, stand out strong and dark as the forward part of a night cloud that sweeps over the glacier-covered heights. Sukh-eh-nukh is represented by a figure uncovered to the waist (the Eskimo, both men and women, occasionally strip off the upper garments in the summer sun). She carries in her right hand an Eskimo lamp, shown as a sun-dog or parhelion such as is often seen near the horizon at sunrise and sunset in the Arctics. She is a part of a cumulus summer cloud that floats near her head. Summer birds are about her, a long line following from the far away horizon. Two fulmar gulls are flying in front of her, and two harbor seals are crying to her, the "Mother of the Seals," from floating ice below, where also little Arctic puffins are ranged in military line.

The story of the pursuit of the sun by the moon is a legend widely spread among the Eskimo people. The North Greenland Eskimo believe, as do all other Innuits from Alaska to Labrador and Baffin Land, that the sun was originally a woman, Sukh-eh-nukh, who in order to escape the unfilial love of her brother, Ahn-ing-ah-neh, fled into the heavens bearing a lighted torch. The brother also carrying a torch pursued her and was transformed into the moon. It is believed that the moon is forever in love with the sun and seeks ever to overtake her, but that since his torch chanced to be a poor one and he is frequently compelled to return to earth to relight it, the sun is enabled to keep well in



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POLAR BEAR AT BAY.

From the painting on the North Wall.

advance. According to the myth, disaster would come if he should succeed in catching her, for with his embrace would come the end of all things.

This legend of the sun and the moon has many variations among the Eskimo people and is sometimes termed the Sedna Cycle, Sedna also signifying the sun. It is possible that we have here not only an allegory of the great Arctic day and night, but also the proof that there has taken root in Eskimo imagination the idea of man's search after the unattainable.

The right portion of the painting, realistic in the extreme, represents the twilight before the approach of the long night, the dramatic interest resting in an encounter between an Eskimo hunter and a polar bear. The hunter has left his sledge and, accompanied by his team, has followed in the chase. He has used his arrows and is now near enough to give a thrust with his lance, the bear's attention being held by the dogs.

That part of the painting at the extreme left tells the Eskimo's method of stalking prey. In the foreground on an ice-floe a hunter, harpoon in hand, is crawling slowly toward two ring seals, which lie basking in the



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ESKIMO STALKING THE SEAL.

From the Painting on the North Wall.

sun near their hole. Eskimo hunters have great skill in giving decoy sounds. They can make cautious approach to gulls by waving a gull's wing in the air, while whistling the bird's notes; they can allay the suspicions of seals by lying flat on the ice and waving a foot in imitation of a seal's head, while giving the characteristic calls of the seals. Beyond the seal hunter in the distance rises above the ice of the glacier, a bell-shaped elevation of land which the Eskimo knows as a "nunatak." Still farther to the left towers an iceberg, while over all is the dawning light of the summer that is being ushered in by Sukh-eh-nukh, the sun goddess.

THE EAST WALL.

The first or northern panel — An Innuït Encampment in Late Autumn.

Pictures of actual events in Eskimo life are continued on the east and west sides of the hall, the unity of the compositions being gained by making the sky line in the east and west panels the same as that of the painting on the north wall. The three panels on the east wall continue pictures of Eskimo life as it goes on during the Arctic night.

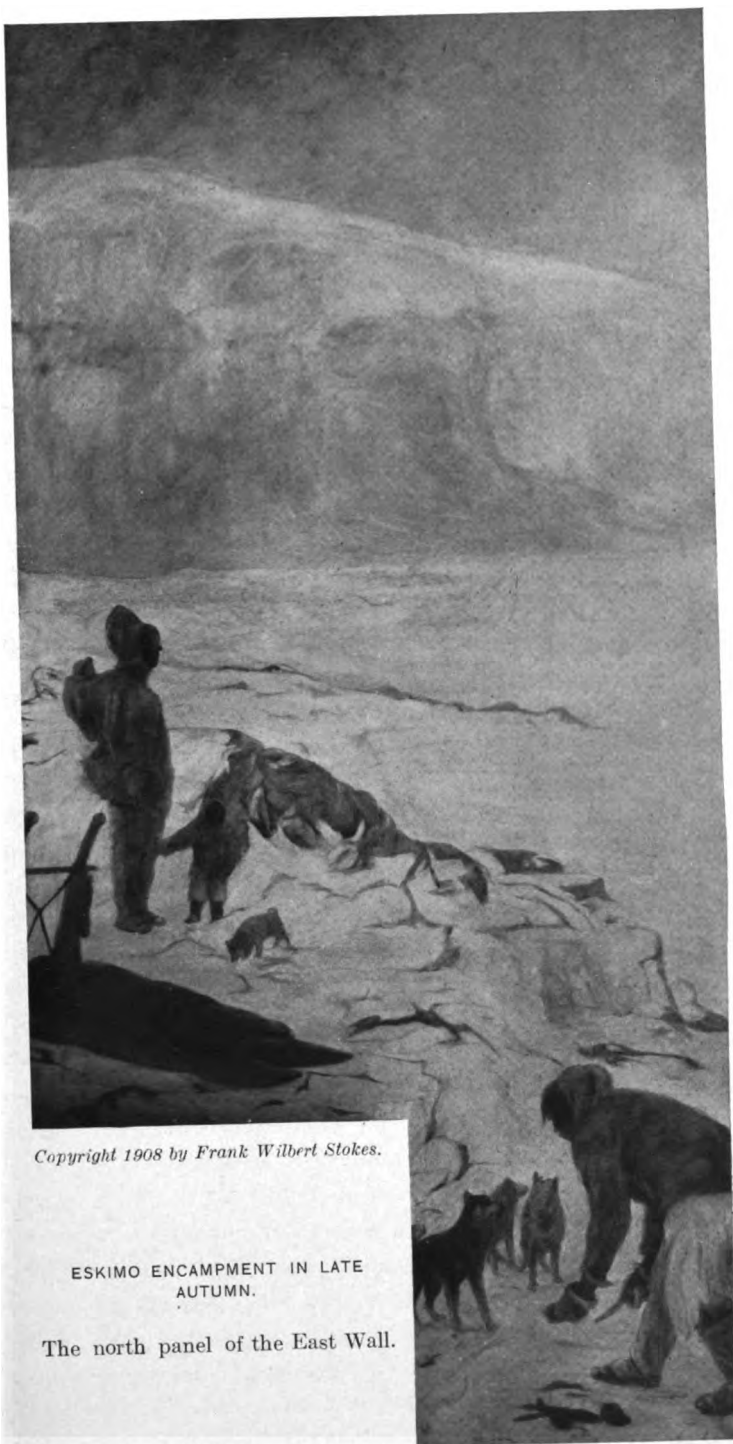
The first of the panels gives a view of Inglefield Gulf, which by November is well frozen over. In the foreground to the right an Innuït (Memkashoo) is cutting up pieces of meat and feeding his team after a hunting trip. The sledge lies to the left, and just beyond is an Innuït woman with her babe carried on her back in a pouch. Such a pouch is made of fox skin and is a part of the hooded upper garment. The head and shoulders of the child are covered by soft fox skin, but the rest of its body lies naked against the mother's bare back and so is kept warm. The child is secured in the pouch by a sinew which passes around its body and around the upper part of the mother's waist.

A little Innuït boy stands by his mother, watching his playmate, an Eskimo puppy. Immediately to the right is the stone-built entrance of the igloo, or winter residence, which, partly covered with snow, is itself seen directly behind the figures. The seal-entrail window of the igloo reveals a pale light from the lamp within, a lamp which must serve the purposes of lighting, heating, cooking and drying for the whole family.

Beyond in the middle distance to the left is a bay, its shore covered with snow which is about three inches in depth at this season. Beyond the bay is a long low promontory stretching into the sea, a November sea, completely frozen over and with an iceberg frozen into it. The stars are brilliant in the sky, while mountain, sea and shore are enshrouded in rich orange light from a sun that is gradually receding.

The Central Panel — Walrus Hunting in February.

The east central panel represents a February scene on the ice of Baffin Bay, which is never completely frozen over. The flaming colors of the Aurora Borealis fill the sky and are reflected by the ice. In their



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ESKIMO ENCAMPMENT IN LATE
AUTUMN.

The north panel of the East Wall.



Copyright 1908 by Frank Wilbert Stokes.

WALRUS HUNTING IN THE LIGHT OF THE AURORA BOREALIS.

The central panel of the East Wall.

weird light is made visible the attack of an Inuit hunter upon a large walrus, one of a group of three in the central foreground of the picture. In the immediate foreground to the right a bull walrus is just emerging from the water. There is no look of fear in the animal's dog-like eye, since he has not yet caught sight of the hunter.

In the Arctics the barking of walrus can be heard for miles. When

the Innuït hunter hears it, he may hitch six or eight dogs to his sledge and travel toward the sound, often with only the light of the moon or of the stars to show him the way. When within a thousand yards to the windward of the animals, he tethers his dogs to the ice, and if they are unaccustomed to hunting and will not remain noiseless, he may turn the sledge upside down, to check any attempt on their part to run away. Armed with a stout harpoon and plenty of walrus-hide line, the Innuït crawls over the ice toward the animals. He conceals himself behind ice blocks or hummocks until the distance between him and the animals is short, then suddenly leaps to his feet, singles out a big bull (as in the painting) and strikes — usually with unerring aim. The whole herd, barking furiously, rushes for the sea. The stricken bull dives, and the walrus-hide line pays out rapidly, but not before the Innuït has deftly thrust his lance, which he carries in his free hand, firmly into the ice. With knee and shoulder braced against the shaft of the lance, he obtains sufficient purchase to play the walrus until the big fellow is so weakened by loss of blood that the hunter can leave his lance to cut two holes in the ice close to the spot where he is standing. Now, whenever the line is slack, he hauls in a few fathoms, and running the noose a couple of times down through one hole and across through the other, obtains a more reliable hold. With the lance now free, he stands over the breathing hole, striking the walrus each time that it rises. When it is finally despatched, he cuts off piece after piece of the meat and seeks his sledge and dogs to carry the spoil home.

Walrus are huge ungainly creatures, weighing upwards of three thousand pounds, but to the nimble Innuït hunter there is usually no difficulty in getting out of harm's way on the ice after he has struck the blow. If, however, the iron point slips, or the ice gives way, or if, as the coils of the line are running out, the hunter's legs become entangled, he is quickly dragged down beneath the water to speedy death.

The Third or Southern Panel. Peterawik in Moonlight.

The third panel represents a winter scene at Peterawik on the shore of Smith Sound. In the foreground at the extreme left is a hunter with sledge and dogs, bringing a load of walrus meat. His snow igloo is at the right, where his wife, carrying a child in her hood, and accompanied by an Eskimo woman, is waiting to welcome him. The sea-ice of Smith

Sound stretches far to the horizon at the north; the head-line of Cape Alexander is visible in the distance. The rocks at the right are characteristic of the west coast of Greenland at this latitude, 76° N.

In the spring before the ice breaks up, the Innuits congregate at Peterawik for walrus hunting. They build their snow igloos on the ice foot, that portion of the sea-ice bordering the land. Here they remain hunting, frolicking and feasting in their joyous fashion, until the sun's warmth has broken up the ice. Then they travel southward, still over the ice, some to the settlements of Inglefield Gulf and others even as far as Cape York.

THE WEST WALL.

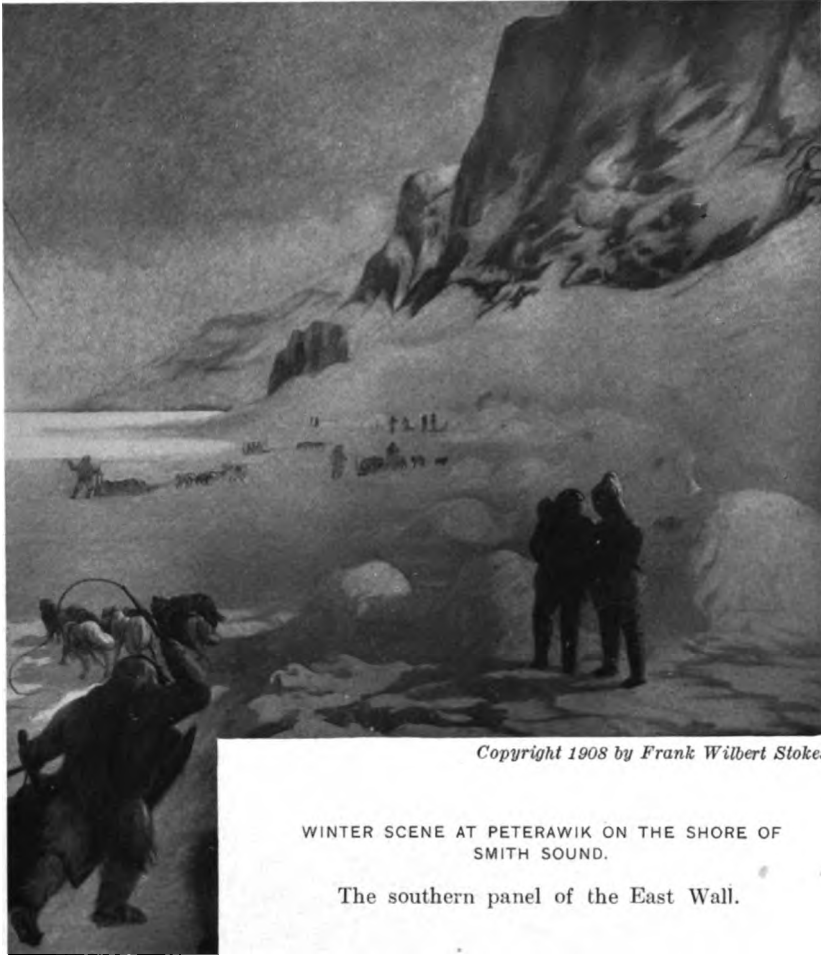
The First or Northern Panel — Reindeer Hunting in Summer.

The paintings on the west wall represent Eskimo life during the long Arctic day.

In the middle foreground of the northern panel a hunter, crouching at the top of a rocky prominence, is in the act of drawing his bow of bone and sinew upon a white reindeer,¹ which has espied too late something to excite its curiosity. In the middle distance at the extreme right, is the continuation of the large iceberg of the central panel of the north wall. Icebergs in the Arctic regions are frequently from 150 to 300 feet in height, measure five to seven times this distance below the surface of the sea, and sometimes have a length of three miles. Beyond the iceberg in the distance is a glacier flowing down from the great ice "Sahara" in the interior of Greenland, while to the left is a dark rocky portion of the submerged land.

In the immediate foreground are purple flowers (*Epilobium latifolium*) which nestle in pockets in the rocks. The middle foreground is covered by stunted grass and mosses, especially by reindeer moss on which the deer are feeding. Many flowers bloom in Greenland and other polar lands during the short summer, notably members of the mustard family, and of the pink, rose, saxifrage and grass families. There is one species of sedge known; willows and birches are found, although growing only two to three inches in height; while daisies, buttercups, yellow poppies, harebells, dandelions, gentians and primroses cover the ground in many places.

¹ A white caribou (*Rangifer pearyi* Allen) discovered by Peary in 1902 in Ellesmere Land near Lake Hazen, latitude 82° N.



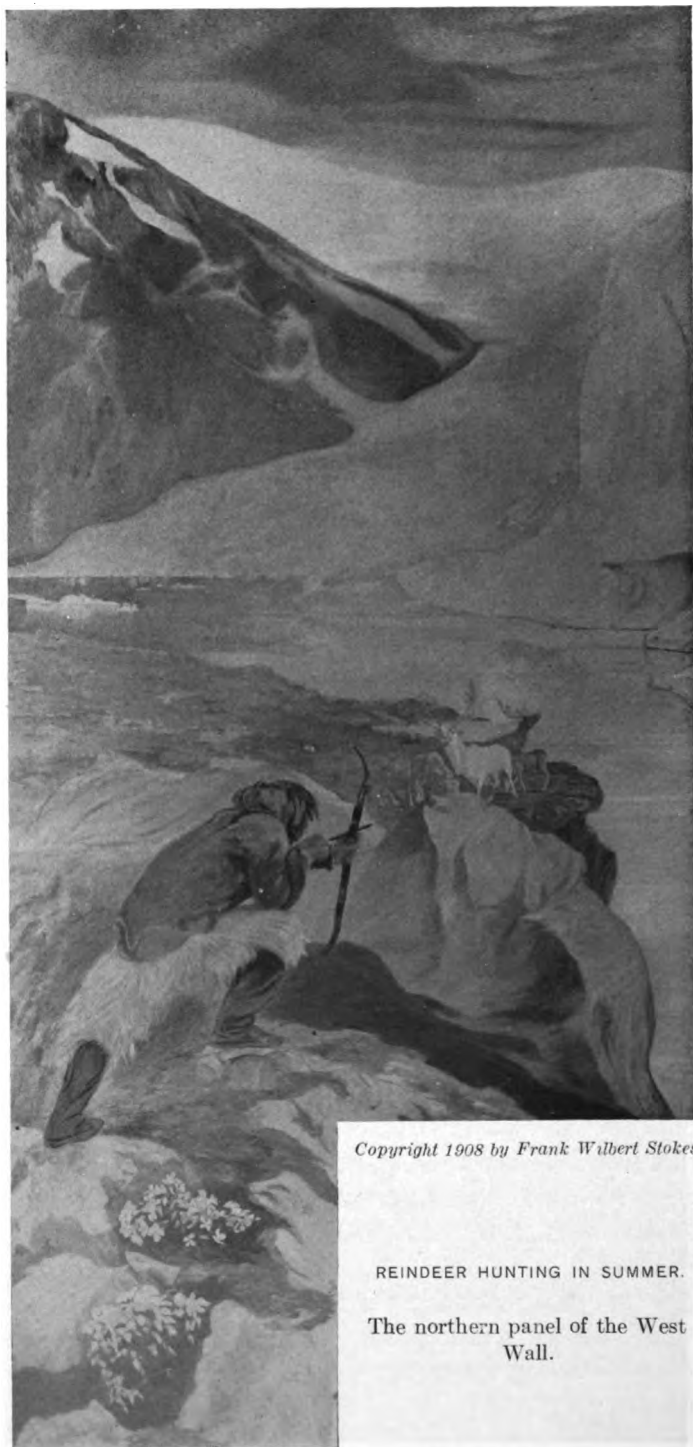
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WINTER SCENE AT PETERAWIK ON THE SHORE OF
SMITH SOUND.

The southern panel of the East Wall.

Another source of bright color in these northern latitudes lies in two species of algæ, one red and the other green. They are microscopic plants that grow on the ice or snow, but they may occur in such profusion as to impart their color to the ground. It is the presence of these algæ that explains the famous "crimson glacier" or "crimson snow" near Cape York.

As to edible plants, there are a few even in this extreme northern region. A blueberry which grows partly concealed under the moss can be secured during the greater part of the year, and is eaten with



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REINDEER HUNTING IN SUMMER.

The northern panel of the West
Wall.



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ESKIMO IN SEALSKIN CANOE HARPOONING A NARWHAL.

The central panel of the West Wall.

relish by the Innuït. There are several plants, of which roots, leaves, buds and even flowers are eaten. A plant resembling celery (*Archangelica officinalis*) is a favorite article of food. Iceland moss is also eaten. The chief sources of vegetable food, however, are marine. A seaweed used commonly for food is *Alaria pylaii*, closely allied to "bladderlocks," of Scotland, and in flavor somewhat like asparagus.

The Central Panel — Narwhal Hunting in Summer.

The dramatic center of this panel is an Innuït in his kayak or sealskin canoe in the act of harpooning a narwhal, which is visible beneath the surface of the water at the left of the boat. To the right in the middle distance are fulmar gulls. In the distance is the great ice river, the Verhoeff glacier.

The narwhal is an animal about which little is definitely known. Some, notably Peary, think that it is the fabled unicorn of the ancients. It occasionally has both a long and a short horn, one of which it may lose, however. The narwhal is blue-black along the back and spotted with dark along the sides, the color fading into ivory white underneath. The thin skin covers a very deep layer of fat or blubber, considered a delicacy by the Innuït. This blubber is eaten raw, as in fact is most of the food in the Arctics, and of course without pepper or salt, neither of which is known to the Eskimo.

In narwhal hunting, the Innuït approaches the animal from the rear and one side, decreasing the distance noiselessly until he is within striking distance. A companion always accompanies the hunter, so that, in the event of his being struck by the narwhal, and his boat overturned, there may be some rescue at hand. The harpoons used in narwhal hunting formerly had heads made of flakes from the iron meteorites near Cape York, but since the first quarter of the nineteenth century the Eskimo have obtained their metal from traders and from whaling and other ships. The harpoon head is joined to a piece of walrus or narwhal ivory, which fits loosely on to the ivory end of the shaft. To the center of this harpoon head, is fastened a line of walrus hide kept in place by the hand that holds the harpoon. The line itself is coiled on the fore part of the kayak, so that it will unwind rapidly and without becoming tangled. Attached to the other end of this line and placed in the after part of the kayak are two objects, a sealskin bag and a drag resembling a box lid. When the animal dives and flees vainly from the pain of the harpoon point imbedded in its flesh, the drag tires it out, and the skin bag, floating on the surface of the water, marks its position and keeps it from sinking. The hunter, who adroitly gets out of the way of the infuriated animal, can thus trace its course and finally tow it home.

The Verhoeff glacier represented in the painting is one of two glaciers

at the head of Robertson Bay, on the northern shore of Inglefield Gulf, West Greenland. It was here that Verhoeff, the meteorologist of one of the Peary Expeditions, while trying to cross the glacier alone, lost his life in September of 1892. The sea wall of the glacier is from 150 to 200 feet high, but the ice shelves out beneath the water, where the buoyancy of the sea breaks off parts which float away as icebergs. This birth of icebergs at the water's edge of a glacier often causes waves thirty or forty feet in height, miles in extent, and attended by volleys of thunderous reports that are terrifying in the ears of the Eskimo. Each of these glaciers is an arm of the inland ice cap of Greenland, a mighty sheet submerging mountains and valleys to a depth of 5,000 feet or more.

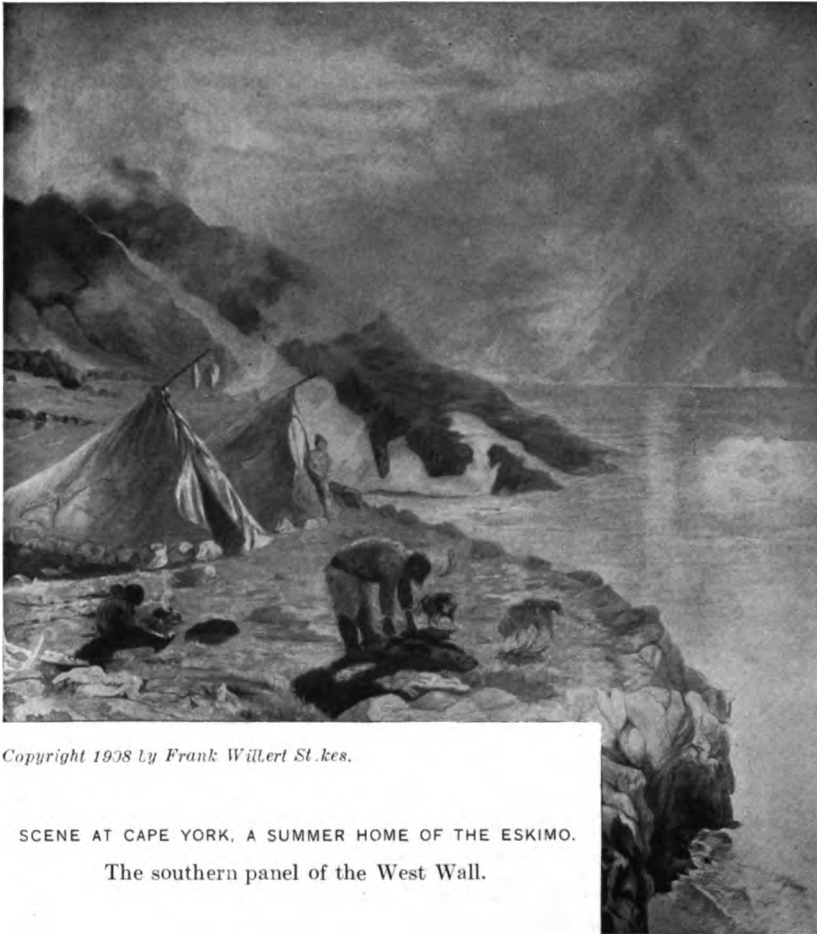
The Third or Southern Panel — Cape York, a Summer Home of the Innuít.

The scene depicted is at Cape York, a summer home of the Innuít, at the head of Melville Bay. Here the Innuít, or Arctic Highlander, as he was misnamed by Sir James Ross, is first met by those visiting the Arctics. The painting gives a view of Cape York looking toward the north.

In the foreground is the camp, where an Innuít leans over a harp-seal which he has killed and is about to cut up, while his dogs are watching for some stray pieces of meat. This man is clothed in bear-skin trousers and a hooded jacket made of about seventy auk skins, the feathers being turned next to the body. He is wearing boots of seal-skin.

To the left in the camp is a girl of about seven years, painted from a sketch made by the artist in 1894. She is clothed in small trousers of fox skin and an upper hooded garment, also of fox skin, and wears boots of sealskin, reaching to the thighs. She is attending a fire of moss and blubber, over which blood soup is being prepared, while guarding from the dogs a piece of meat on the ground at her right. Behind the girl are two sealskin tents (tupekhs) from one of which a young woman is emerging.

Beyond the tents are mountains towering 1500 to 3000 feet above the camp. The summits of these mountains are frequently obscured by dense fogs, from which come continually the wild cries of innumerable multitudes of kittiwake gulls and little auks.



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SCENE AT CAPE YORK, A SUMMER HOME OF THE ESKIMO.

The southern panel of the West Wall.

In this bay, but some miles to the eastward, the three meteorites now on exhibition in the foyer of this museum remained for ages. It was Peary who wrested them from their ancient abode and brought them to New York in 1895. From these meteorites, in olden times, the Innuits flaked off pieces for use in knives, harpoons and arrow heads, to aid in the struggle for food and life.

MUSEUM NEWS NOTES.

SINCE our last issue the following persons have been elected to membership in the Museum: Annual Members, MESSRS. WILLIAM H. ALLEN, CHARLES COLLINS, MAUNSELL S. CROSBY, GUSTAVE F. KOLB, GILBERT ROBERT LIVINGSTON, JR., HENRY MEHL, WILLIAM LINCOLN PARKER, HENRY M. TOCH, WM. WHITMAN, JR., and JOHN WILLIAMS and MISS ANNIE TWEEDIE.

THE LIBRARY has recently received from His Royal Highness the Illustrious Prince and Archduke Ludwig Salvator of Austria twenty volumes descriptive of the natural history of some of the islands and towns of the Mediterranean. These books were privately printed by the Archduke of Austria and were published in a most sumptuous manner. The works are as follows: *Liparische Inseln*, eight volumes, *Ustica*, *Columbretes*, *Alboran*, *Benzert*, *Eggligio*, *Bougie*, *Zante* (two volumes), *Parga* (two volumes), *Leokas* and a splendid panoramic view of *Alexandrette*.

MR. WILLIAM G. DE WITT, one of our Life Members, has just presented to the Library his private collection of more than two hundred volumes on microscopical subjects, which includes a complete set of the Transactions of the Royal Microscopical Society from the beginning to the present time.

THE Department of Anthropology has recently purchased from Professor Eugene Schroeder a collection from the South Sea Islands containing, among other objects, garments, hair ornaments, chains, fans, war clubs and an assortment of twenty-five shells from the Carolines.

THE Department of Ornithology has received thirty-one King and other penguins from the Antarctic, collected by Captain B. D. Cleveland. The series includes specimens of both young and adults and represents an entirely different kind of bird life from anything the Museum has had before.

On account of the recent introduction of the Brown-tail Moth to New York state, a special exhibit of the Brown-tail and Gypsy moths has been placed on the first floor near the elevators. The life histories of these pests together with the damage they do, relatively harmless insects which might be mistaken for them, and other introduced insects are shown.

THE fall exhibition of the Horticultural Society of New York will be held at the Museum from November 3 to 7. The exhibition will be open on Wednesday after 7 o'clock P. M. especially for the members of the Museum, the Society and affiliated organizations. On Thursday, Friday and Saturday from 9 A. M. to 5 P. M. and from 7 to 10 P. M., and on Sunday from 1 to 5 P. M., the exhibition will be open to the general public.

LECTURE ANNOUNCEMENTS.

MEMBERS' COURSE.

THE first course of illustrated lectures for the season 1909-1910 to Members of the Museum and persons holding complimentary tickets given them by Members will be given in November and December.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

November 18.—**PROF. HERSCHEL C. PARKER**, "Alaska and the Exploration of Mt. McKinley."

Professor Parker of Columbia University for many years has made a specialty of climbing the high mountains of northwestern North America and has made many first ascents in the Canadian Rockies and the Selkirks. He was one of the party that attempted the ascent of Mt. McKinley in 1906. His photographs are superb.

December 2.—**MR. A. RADCLYFFE DUGMORE**, "Camera Adventure in the Wilds of Africa."

Mr. Dugmore is a naturalist who has made a specialty of hunting big game with the camera, and his photographs obtained by flashlight and daylight are wonders. They preserve the record of a 1500-mile journey on foot through the dense jungle of British East Africa and include a charging rhinoceros at close range, lions at from nine to twelve yards distant and herds of hippopotamus, zebra and antelope.

December 9.—**MR. DONALD B. McMILLAN**, "With Peary in the Arctic."

Mr. McMillan was a member of the scientific staff of the Steamer "Roosevelt" on her latest trip to the Arctic regions and was the leader of the second support-

ing party in Commander Peary's successful dash to the Pole. He had charge of the tidal work and of compiling notes on the Eskimo and the natural history of the expedition.

December 16.—DR. HUGH M. SMITH, "The Coast of Brittany and the Industries of the People."

Dr. Smith is Deputy Commissioner of the United States Bureau of Fisheries and has traveled extensively in the discharge of his official duties. Recently he made a particularly interesting excursion along the coast of France and obtained some remarkable photographs. The results of this expedition are embodied in this lecture.

PUPILS' COURSE.

THESE lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on the presentation of Membership tickets.

Lectures begin at 4 P. M.

	Oct.	Nov.	
Monday,	25	15.—	"The Development of New York City." By ROY W. MINER.
Wednesday,	27	17.—	"Life in the Arctic Regions." By MRS. A. L. ROESLER.
Friday,	29	19.—	"American Forests and Their Uses." By GEORGE H. SHERWOOD.
Monday,	Nov. 1	22.—	"Scenes in the British Isles." By LOUIS HUSAKOF.
		Dec.	
Wednesday,	3	1.—	"Life Among Our Indians." By HARLAN I. SMITH.
Friday,	5	3.—	"Animals Helpful to Man." By ROY W. MINER.
Monday,	8	6.—	"Mining Industries of the United States." By E. O. HOVEY.
Wednesday,	10	8.—	"Animals Injurious to Man." By F. E. LUTZ.
Friday,	12	10.—	"Travels in South America." By LOUIS HUSAKOF.

PEOPLE'S COURSE.

GIVEN in coöperation with the City Department of Education.

Tuesday evenings at 8 o'clock. Doors open at 7:30.

All lectures illustrated with stereopticon views.

November 2.—MR. R. CORNELIUS RABY, "The Historic Alamo City."

November 9.—MISS MARY V. WORSTELL, "The Yosemite Valley."

November 16.—“MR. BENJAMIN S. COMSTOCK, “The Canadian Rockies.”

November 23.—DR. EDWARD P. CROWELL, “Across the New England States.”

November 30.—Lecturer and subject to be announced.

Saturday evenings at 8:15 o'clock. Doors open at 7:30.

DR. WILLIAM L. ESTABROOKE,—the last four of a course of eleven lectures on inorganic chemistry, illustrated by experiments.

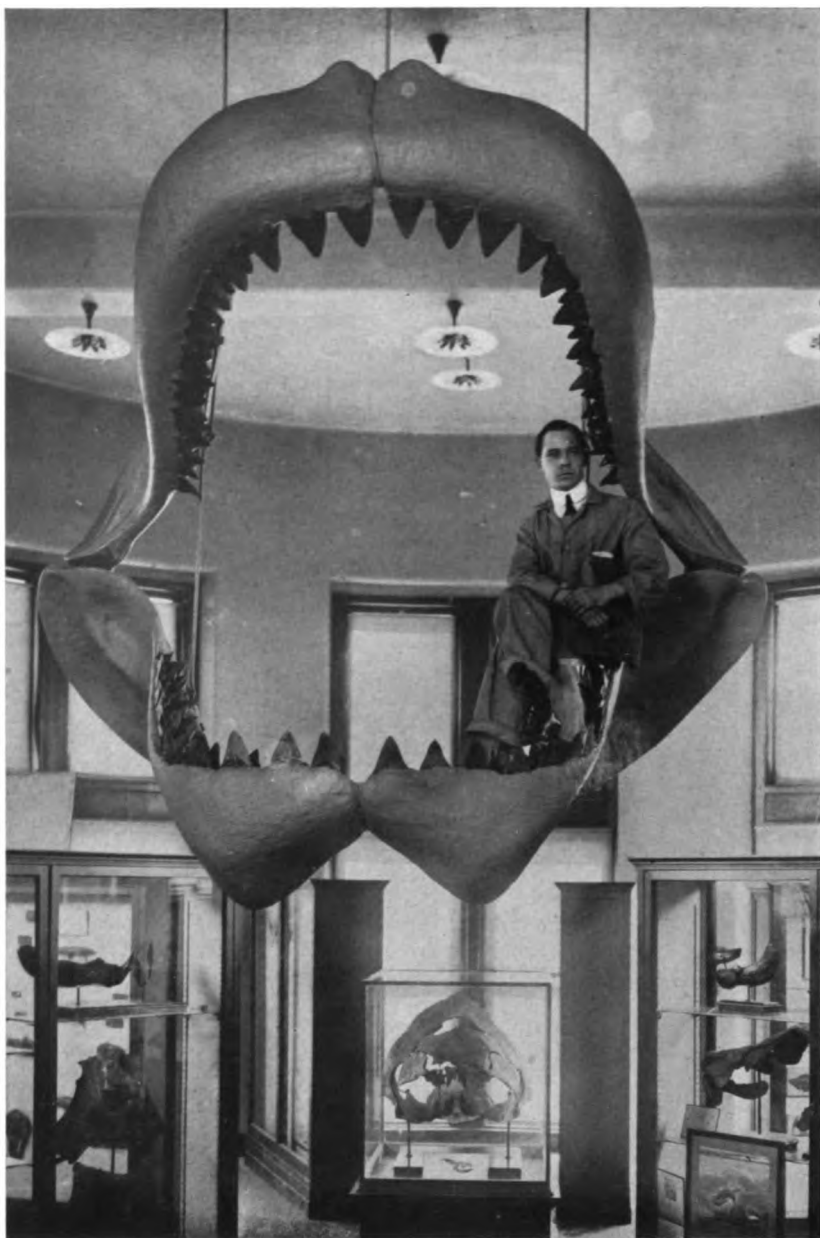
November 6.—“Chlorine and Hydrochloric Acid.”

November 13.—“Fluorine, Bromine and Iodine.”

November 20.—“Nitrogen and Its Oxides; Nitric Acid and Ammonia.”

November 27.—“Carbon and Some of Its Compounds.”

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.



RESTORATION OF THE JAWS OF THE FOSSIL SHARK, CARCHARODON MEGALODON.

The American Museum Journal

VOL. IX

DECEMBER, 1909

No. 8

THE GIANT OF ANCIENT SHARKS.

AT the entrance of the Hall of Fossil Fishes there is now exhibited a restoration of the jaws of a shark (*Carcharodon megalodon*) which lived along the coast of South Carolina, in Tertiary time. There can be no doubt that this was the largest and most formidable fish living or extinct of which we have any record. The jaws of a fully grown specimen measured about nine feet across and must have had a gape of five or six feet. The teeth themselves average about six inches in height in the middle of the jaw, and they gradually decrease in size in the direction of the sides of the mouth, the smallest teeth measuring about two inches.

In the present restoration the teeth have been arranged as in the living species of *Carcharodon*, the great White Shark or Man-Eater, for there can be no question that the fossil shark differed in no essential structure from its modern relative. Accordingly the jaws of *Carcharodon rondeleti* were carefully measured (a splendid pair having been loaned by the Museum of Natural History of Paris, through the courtesy of Professor Valliant), and the model was prepared according to scale, that is, in accordance with the proportions of the teeth in the extinct and in the living form. The fossil teeth were then arranged on the jaws in the same number of rows and in the same number of banks of graded sizes. Fortunately for this purpose a large assortment of teeth of the fossil shark was available, out of which an almost complete dentition was selected. This material had been collected during many years by a resident of Charleston, Joseph Cohen, and the collection was secured through a grant from the Cleveland H. Dodge fund.

The accompanying picture gives an idea of the impressive size of the ancient *Carcharodon*. Indeed from the teeth alone one can form a reasonably accurate estimate of the dimensions of the fossil fish, for it is known that a specimen of the living species in which the largest tooth was one and one half inches in height measured twenty feet, and that another having teeth three inches in height had a total length of forty feet. It therefore follows that the length of the Carolina shark whose

teeth measured six inches was approximately eighty feet, an estimate, by the way, which was made many years ago by Professor Goode. The largest living shark is the Whale Shark, *Rhinodon* which probably does not exceed fifty feet in length.

In spite of its great size, *Carcharodon* appears to have been quite common in its day, judging at least from the number of teeth found in the deposits of phosphate. And from this fact one may form an idea of the richness of the marine fish fauna of that time. For where there existed one of these sharks there must have been a vast number of fishes of the usual bony-fish type, for sharks are proverbially rapacious, and we can estimate fairly that the daily provisioning of so huge a creature implies the capturing of tons of bony-fishes. This is worthy of mention also, because it gives us a striking illustration of the imperfection of the geological record. It is a well-known fact that in regions where the teeth of this shark are plentiful, there occur few fossils of the common kinds of fishes. Even the most fragmentary remains of bony-fishes (teleosts) are usually lacking. It is none the less clear from the very presence of the sharks that a contemporary fish-fauna must have been represented in the most abundant way.

BASHFORD DEAN.

EXPERIMENTAL WORK WITH POMACE FLIES.

EXPERIMENTAL studies in evolution are important not only for their theoretical interest, but also because it is believed that the principles worked out in the lowest forms of life will apply also to domestic animals and plants and even to man.

It is the natural course of scientific progress for verbal description and speculation to be followed by mathematical statement and experimental analysis. Certain experiments were made even before Darwin's time and a large part of Darwin's own work was experimental; but the painstaking studies of de Vries concerning the origin of plant species, together with the recognition of Mendel's Laws of Heredity, not only have given an impetus to experimental evolution, but also, in a large measure, have determined the character of the work. As a consequence, research by pedigree breeding for de Vriesian "mutations" and the

testing of the manner of inheritance have been energetically carried on during the past few years and have yielded many interesting results. Other factors of evolution, such as the effect of environment, the laws of fluctuating variation, and selection, have also been studied quantitatively and experimentally, although to a less extent.

In these experiments it is important to know the characters of both the ancestors of the individuals used and of their progeny. Pedigreed cultures must be made. Therefore, it is desirable to use some rapidly breeding form which can be easily reared. Domestic animals and insects have been favorite zoological material, and among the latter the common red-eyed Pomace Fly (*Drosophila ampelophila*), also known as the Vinegar Fly, Sour Fly and Fruit Fly, has been found to be an excellent laboratory creature. It feeds upon fermenting vegetable matter. At ordinary room temperature a generation can be obtained every two weeks. The eggs are laid directly upon the food (*e. g.* ripe banana)



Fig. 1.

FIG. 1. FORE LEG OF A MALE POMACE FLY, *DROSOPHILA AMPELOPHILA*.

and hatch in two or three days into legless larvæ, or maggots, which pupate after about a week of feeding. The pupal period is four or five days long, and in a trifle over twenty-four hours after emergence from the pupal case the adults mate and a new generation is started. The adults live, on the average, three weeks or a month and the female may lay as many as three hundred eggs.

The males differ from the females very strikingly in the adult stage. They are somewhat smaller and the under side of the abdomen is more completely pigmented. The most interesting difference, however, is the possession by the males of a relatively large comb-like structure, upon the anterior legs (see Fig. 1). This is a secondary sexual character that is as pronounced as the antlers of deer. It would be explained by many, since no other function is apparent, as a male adornment which is pleasing to the female. However, I have found that the males from which the "sex combs" have been removed are just as successful in

getting mates as those which possess it, although strong evidence of sexual selection with respect to other characters is being obtained.

It is generally believed that close inbreeding is always attended by decreased vitality and disuse by degeneration. This is not the case with *Drosophila ampelophila*. It has been repeatedly bred for a large



Fig. 2.

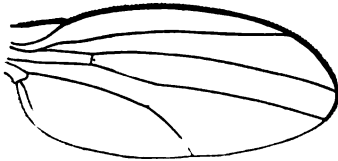


Fig. 3.

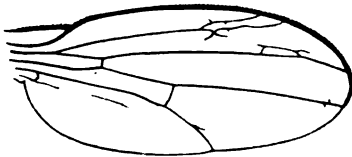


Fig. 4.

FIG. 2. A WING OF *DROSOPHILA AMPELOPHILA* SHOWING REDUCTION OF VENATION DUE TO SELECTION.

FIG. 3. A NORMAL WING OF *DROSOPHILA AMPELOPHILA*.

FIG. 4. A WING OF *DROSOPHILA AMPELOPHILA* SHOWING INCREASE OF VENATION DUE TO SELECTION.

number of generations, mating brother and sister, without disastrous results. I have, furthermore, made careful measurements of the wings of successive generations and found that although my pedigreed stock has not been allowed to fly for more than fifty generations, there has been no degeneration of the wing either as to size or as to venation. On the other hand, by selective breeding I have been able to get specimens with greatly reduced wing venation as is shown in Figure 2, Figure 3 showing the normal wing. Selection in the other direction, *i. e.*, for increased venation, is just as effective (Fig. 4). A study of the inheritance of these variations was begun at the Station for Experimental Evolution of the Carnegie Institution and is being continued, with other mathematical and experimental studies of evolution, at the Museum. About 200,000 pedigreed individuals of this species alone have already been obtained. The inter-

pretation of the results of this work is complicated by the fact that the two sexes display the abnormalities to unequal degrees and also because the mode of inheritance deviates strongly from expectation on the basis of the commonly accepted laws.

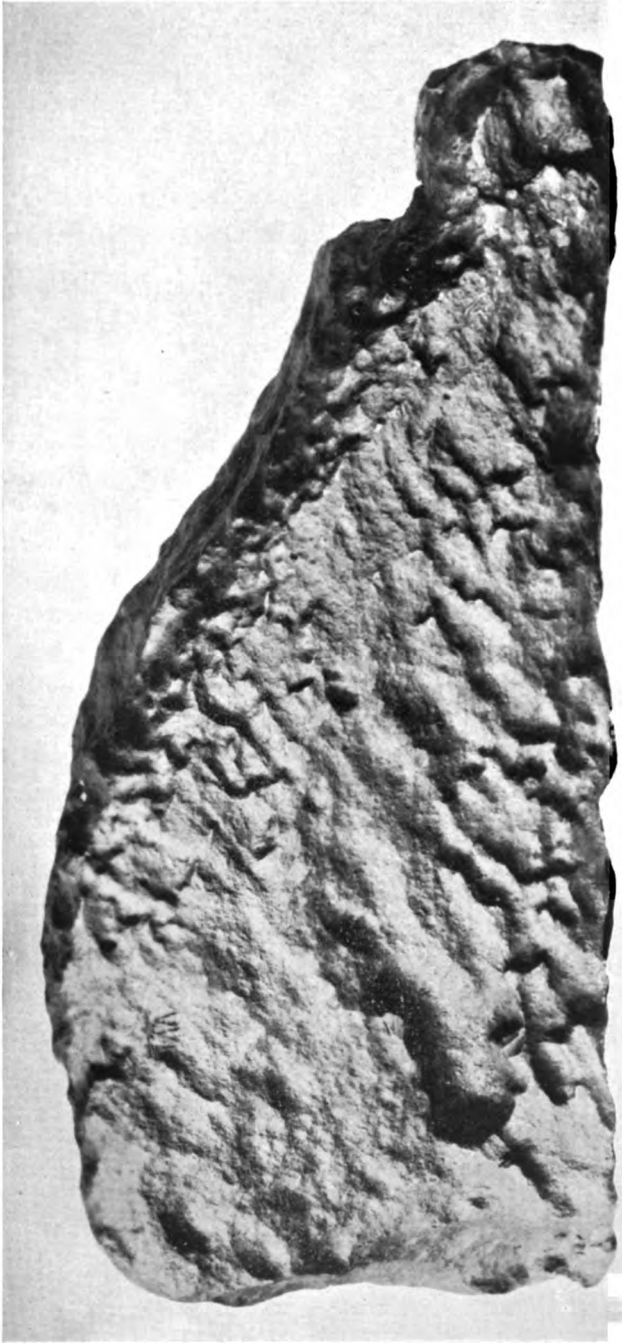
F. E. LUTZ.

THE GUFFEY, COLORADO, METEORITE.

IN November, 1907, two cowboys, Robert L. Pope of Canyon City, Colorado, and J. T. Witcher of Guffey, Park Co., Colorado, discovered an iron meteorite while they were riding after their cattle along the head waters of the Freshwater River. The exact location of the find is the N. E. $\frac{1}{4}$ of the N. E. $\frac{1}{4}$ of Section 16, Township 35, Range 72, 6th Principal Meridian, W. in Fremont County, Colorado. The nearest post office is Guffey, Park County, about three and one half miles from the spot where the iron was found. The cowboys secured help and at last succeeded in getting the mass out of the mountains and to Cripple Creek. The American Museum purchased it from the finders, and it is now on exhibition in the foyer.

Guffey, as it must be called from the name of the post office nearest to the spot where it was found, is a "siderite," or wholly metallic meteorite 36 $\frac{1}{2}$ inches long, 15 inches in maximum height and 8 inches wide. Its weight is 682 pounds. The mass is roughly pear-shaped, but much flattened. One edge is so straight and is so nearly rectangular with reference to the adjoining sides that it seems like a definite fracture, indicating the possibility of there being another fragment or other fragments of the meteorite in the vicinity of the spot where this was found. The surface of the iron is covered with an extremely thin film of black iron oxide, which looks as if it might be the original skin formed by the passage of the meteorite through the air. At any rate, the iron is free from rusty scale and apparently had not lain long upon the mountain before it was found. The statement is made that a vivid meteor passed over the Freshwater River region in the fall of 1906, and the supposition is that this mass is a part of it. The evidence, however, is not strong in support of this theory. The cowboys who found the iron were not searching for a meteorite, and in fact did not know that they had found one. The brilliant white color disclosed on rubbing the surface led them to suppose that they had found a mass of pure silver, and they started to get it to town accordingly, after making an unsuccessful effort to cut off the small end of the specimen.

Two sides show in good development the "thumb marks" or "piëzographs" characteristic of meteoritic masses. These markings are particularly deep upon the flat side shown in Figure 2, and they are less



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FIG. 1. GUFFEY METEORITE. FRONT, OR "BRUSTSEITE".

Shows furrows and subconical pits due to flowage as a result of superficial melting produced by friction with the air. These furrows and points indicate that the meteorite passed through the air with this side and the upper right hand end in front most of the time.

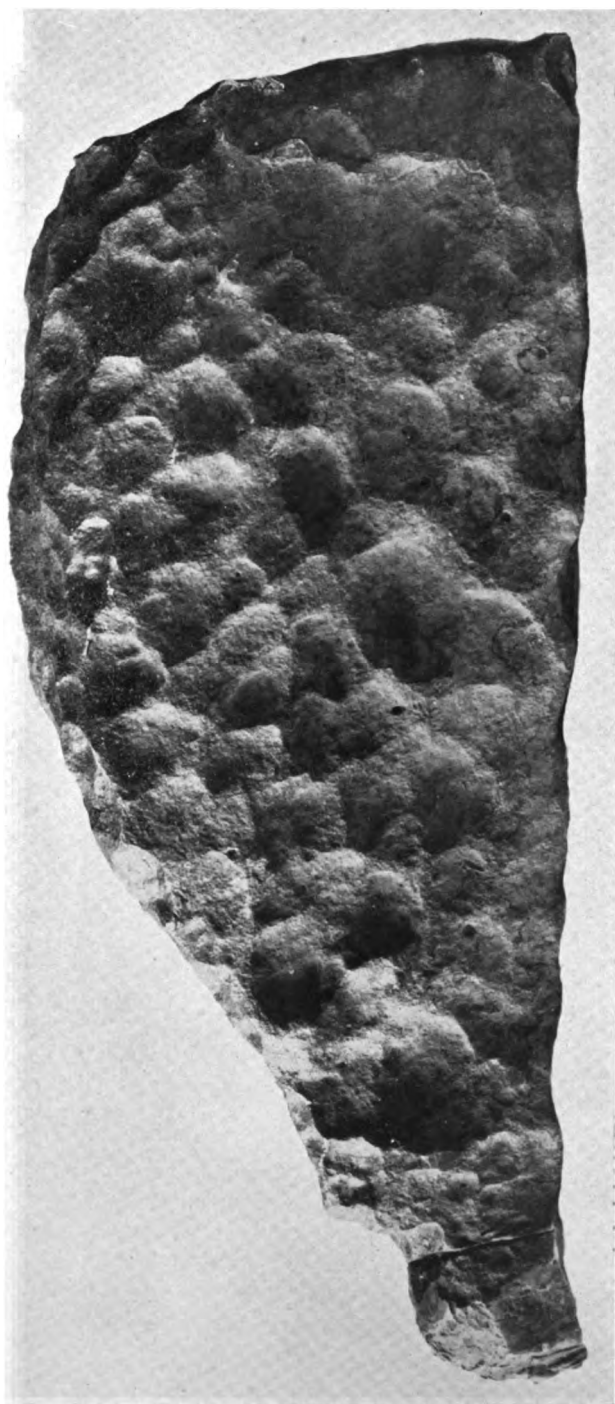
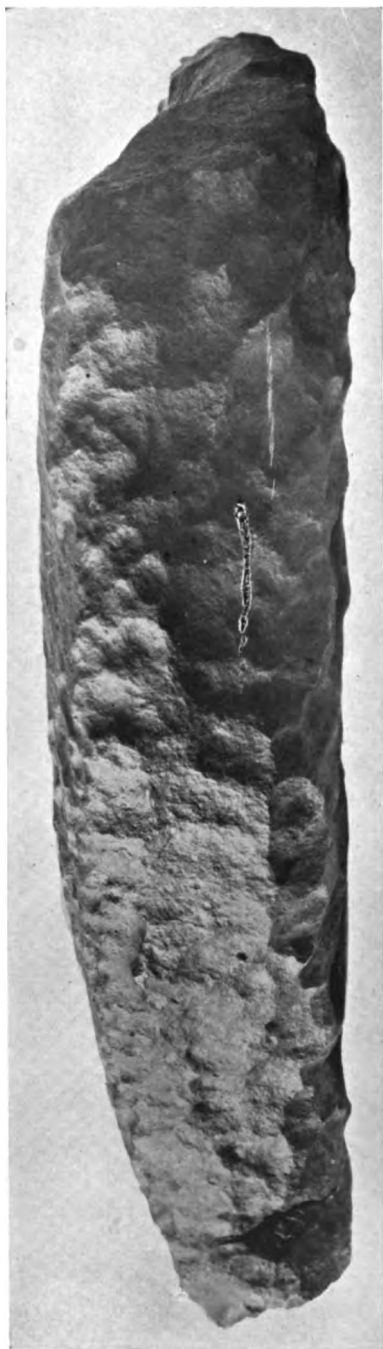


FIG. 2. GUFFEY METEORITE. REAR SIDE, PROTECTED DURING ITS JOURNEY THROUGH THE AIR.

The depressions called thumb-marks or piëzoglyphs, which usually cover the surface of a meteorite, are strongly developed on this side of the mass.



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FIG. 3. GUFFEY METEORITE. UPPER EDGE OF MASS AS EXHIBITED.

The upper left hand portion of this edge probably was in front during most of the meteorite's flight through the air. The surface is indented with numerous thumb-marks and flow furrows.



FIG. 4. GUFFEY METEORITE. LOWER EDGE OF MASS AS EXHIBITED.

Showing the straight, almost rectangular relation of this surface to its neighbors, which indicates a probable fracture of the original mass, while in the air. Piezoglyphs, or thumb marks, are poorly developed on this surface.

pronounced and somewhat more elongated in the round edge shown in Figure 3. The flat side shown in Figure 1 has comparatively few round piëzoglyphs, but it has many pits, grooves and points due to the flowing of the melting surface of the mass during flight through the atmosphere. The almost square edge, which is illustrated in Figure 4 and which is considered to be an abrupt fracture occurring when the meteorite was near the end of its atmospheric flight, has an oxidized skin like the rest of the mass but shows piëzoglyphs very imperfectly.

Figure 1 shows the side which was in front during most of the meteorite's atmospheric flight and is called by the Germans the "brustseite." The position of the furrows indicates that the line of flight was toward the upper right hand quarter of the mass as shown in this picture. Although the iron is unusually uniform and dense in structure, as will be brought out under the discussion of its composition, it evidently yielded unequally to the heat produced by friction with the atmosphere, and the air in passing over its surface plowed deep furrows ending in subconical pits and left sharp projections pointing forward in the direction of flight.

A piece of the iron which had been sawed from the small end of the mass was polished and etched with dilute nitric acid at the Museum and

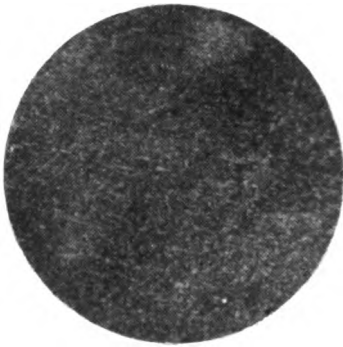


FIG. 5. GUFFEY METEORITE. PHOTO-MICROGRAPH.

Polished section magnified 100 diameters to show cryptocrystalline structure.

was afterwards polished again and treated with dilute and strong nitric acid and picric acid in succession by the chemists, Booth, Garrett and Blair, Philadelphia, picric acid proving to be the best mordant. The surface does not show the Widmanstätten lines usually characteristic of meteoritic iron, but instead it possesses an extremely fine granular crystalline structure, which is shown magnified 100 diameters in Figure 5 from a photomicrograph made by the analysts. The homogeneous character of the mass and the paucity of nonmetallic contents are indicated by the high specific

gravity. The chemical analysis, made by Booth, Garrett and Blair, resulted as follows:

Iron	88.687%
Nickel	10.547%
Cobalt	0.546%
Chromium	0.018%
Manganese	none
Carbon	0.025%
Silicon	none
Sulphur	0.016%
Phosphorus	0.020%
Total	99.859%

Specific gravity, 7.939.

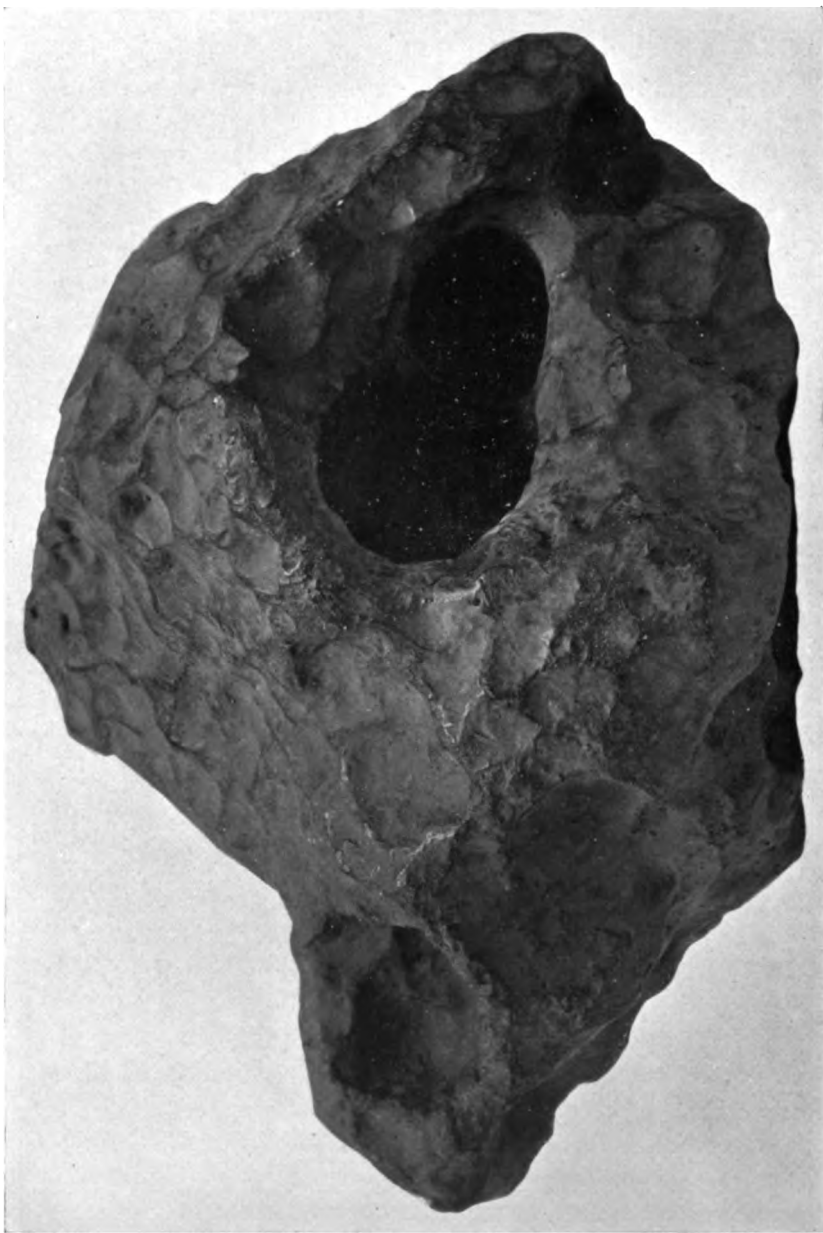
This analysis shows that the Guffey meteorite contains rather more than the average percentage of nickel and cobalt and unusually low percentages of carbon, sulphur and phosphorus. The extremely small amount of sulphur found indicates the practical absence from the mass of troilite, the protosulphide of iron which is found only in meteorites. This inference is substantiated by the few particles of this mineral which are to be seen on careful examination of the surface. The low content of phosphorus might have been inferred from the practical absence of schreibersite (a phosphide of nickel and iron characteristic of meteorites) as shown by the polished and etched specimen, this mineral being the substance that usually brings the Widmanstätten lines out in relief.

EDMUND OTIS HOVEY.

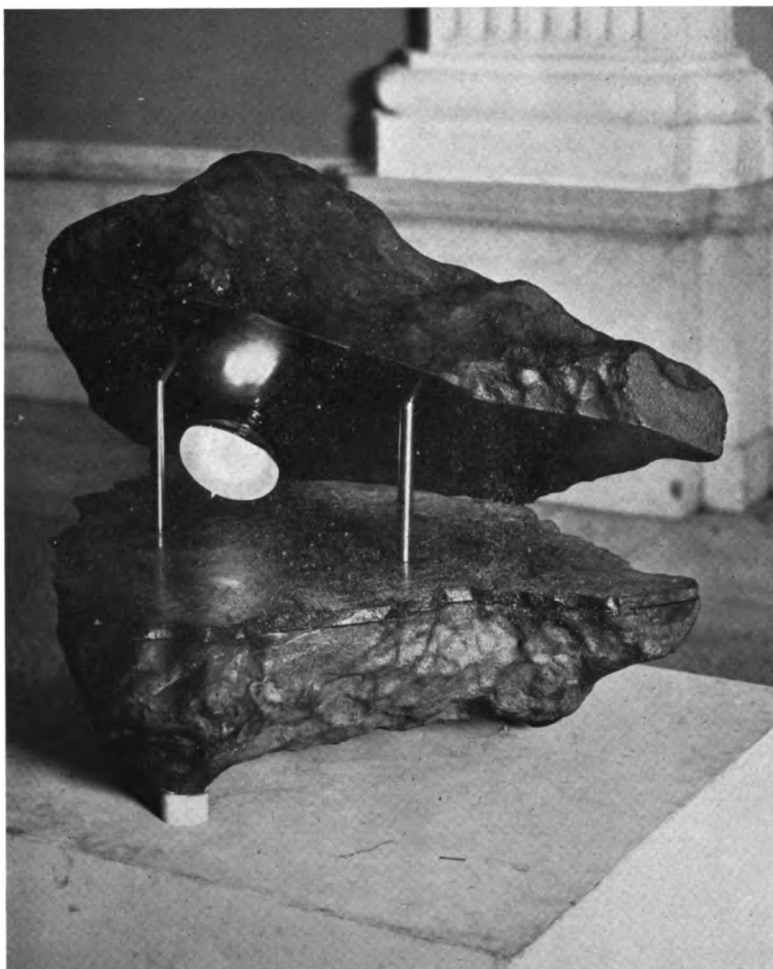
RECENT ADDITIONS TO THE METEORITES IN THE FOYER.

DURING the past summer three important accessions were installed among the meteorites in the Foyer. They were (1) the newly discovered iron known as Guffey which is described elsewhere in this issue of the JOURNAL, (2) a slice and cast of the iron meteorite called Gibeon and (3) the largest known portion, weighing 20 pounds 3 ounces, of the stone meteorite Modoc.

The manner of installing the Gibeon section is a new departure in the mounting of meteorites, as far as we know. About two years ago we received through exchange with the Natural History Museum of Hamburg, Germany, a plaster cast of the larger of the two known por-



GIBEON IRON METEORITE. GENERAL VIEW.



GIBEON IRON METEORITE. GREAT NAMAQUA LAND, AFRICA.

Cast iron reproduction with etched slice of original in its proper position. The electric light has been inserted in order to display clearly the "Widmanstätten lines" that show the crystalline character of meteoritic iron and the lack of such lines in artificial iron.

tions of this interesting find, together with a polished and etched slice giving a complete section of the mass in its greatest dimensions and showing in remarkably beautiful development the Widmanstätten lines that are generally characteristic of meteoritic iron. The original mass weighed 562 pounds. We determined the correct position of the slice in



GIBEON IRON METEORITE. POLISHED AND ETCHED SECTION.

One fourth natural size.

the plaster cast, cut the latter in two and fitted the slice into its proper place. Then we had each portion of the plaster cast reproduced in cast iron, and hinged the two parts together, with the natural section in its original position, thus showing not only the appearance of the mass

as found but also its internal crystalline structure. We also polished the opposing surface of the cast iron reproduction and treated it with dilute nitric acid in the same manner as the meteorite itself had been treated, in order to bring out the fact that artificial iron does not possess the crystalline structure which is so characteristic of the other. A natural depression fortunately pierced the upper half of our cast and gave us an ideal way of introducing an electric light to enable visitors to see clearly the Widmanstätten lines of the meteorite and the amorphous character of the cast iron.

The meteorite takes its name from the little village of Gibeon whose geographical position is about 25° 8' South latitude and 17° 50' East longitude in the eastern part of Great Namaqua Land, in German southwest Africa, the home of the Hottentot. Two other famous iron meteorites have been found within a radius of 125 miles of Gibeon: Mukerop, of which there is a fine slice in the Ward-Coonley collection of meteorites, now in our Hall of Geology, and Lion River, which came from near the hamlet of Bethany and is represented by a small part of a slice in our general series. The latter has been known for more than half a century, having been described by Prof. C. U. Shepard in 1856. The former has come to public notice more recently. It resembles Gibeon in crystalline structure so closely that some authorities have been inclined to consider them parts of the same fall. Lion River, however, is entirely distinct in character.

Modoc is an aërolite or stony meteorite that was seen to fall near the town of Modoc, Scott County, Kansas, and the occurrence is described by Mr. J. K. Freed, an eyewitness of the fall and the finder of our specimen, as follows:

"The meteorite appeared as a ball of fire in the west September 2, 1905, at 10 o'clock in the evening, the sky being cloudless and the clear atmosphere of the plains being undisturbed by wind. From Scott City to Syracuse, 75 miles southwest, it was light enough to read common newspaper print on the street and the explosions rattled doors and windows. The mass exploded, and then the resulting fragments exploded several times in rapid succession. The fragments gleamed brightly at first but their light went out almost immediately after the explosions. Then came the sounds of the explosions, the whistling like bullets or heavy hail of the smaller fragments and a most intense humming like that of a rapidly revolving cylinder of some heavy machine, evidently caused by the larger mass. This was followed by

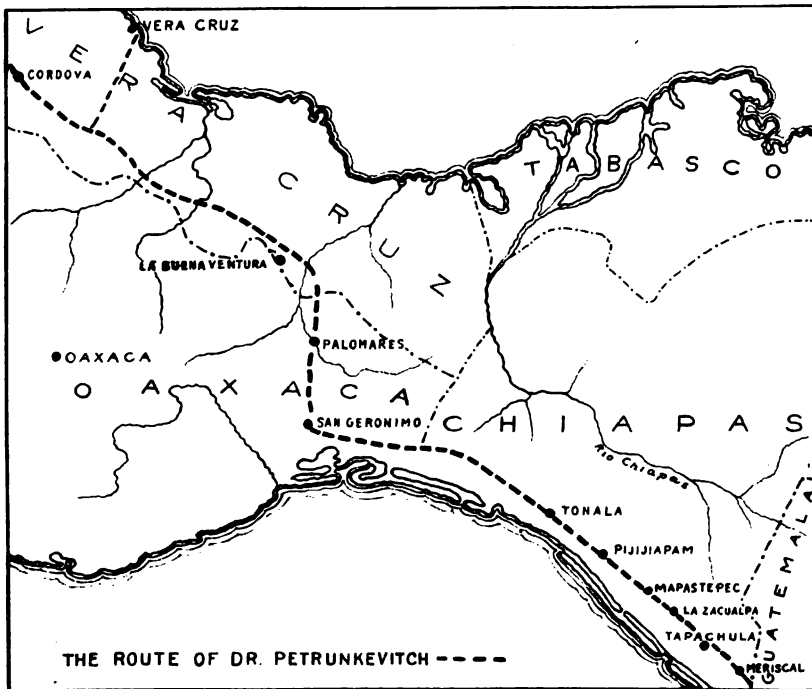
fierce cannonading (echoes of the explosions?) like the discharge of a battery of artillery or a rapid-fire machine gun, gradually growing fainter and dying out like rolling thunder in the distance. The first explosion took place about 40 miles west of the fall and fully as far above the surface of the earth. The fragments were scattered over an area nine miles by three; the largest ones going farthest. I heard the largest one drop and hunted for it for over two years.

"On May 6, 1908, I was breaking new ground on the prairie with a gang-plow and a five horse team that was a little too high-spirited to be controlled easily, but having half-mile furrows as smooth as a lawn before me, I had set the plow a few notches deeper into the ground and let them go, thinking nothing of meteorites. While congratulating myself upon our speed we suddenly — very suddenly — struck something hard. It threw me out of my seat and piled my gang-plow up in a promiscuous heap against the team, which was too badly surprised to do anything. I had plowed hundreds of acres and knew there was not a rock within ten miles of me, so my first thoughts were of dynamite. After sitting for some time trying to think, I ventured back to where my plow had left the ground. Seeing nothing, I commenced stabbing with my jack-knife and soon located the cause of the disturbance. It was the largest fragment of the Modoc meteorite and completely buried under the tough buffalo sod (virgin soil) and was pounded in so hard that the force of the blow of my gang-plow had not loosened it. So completely was it buried, that I had hunted dozens of times all over that pasture without either finding the rock or the hole in the ground which it had made."

Twenty-five fragments of Modoc have been found. All are covered with the thin glassy black coating or "skin" that is generally characteristic of aërolites and that is caused by the melting of the surface in the great heat generated by friction with the air during flight through the earth's atmosphere. Flakes broken off by the plow reveal the interior of the mass and show that the meteorite is composed of whitish stony material like some terrestrial lavas, but containing bright specks of metallic iron.

A TRIP TO SOUTHERN MEXICO FOR SPIDERS.

WHEN I found in June, 1909, that I was to visit southern Mexico to collect spiders, I anticipated the trip with great interest since only a few species of spiders had been described from the States of Vera Cruz and Tabasco, while Chiapas remained entirely unexplored. From the geography of the country we should expect to find a continuation of the Central American coast fauna along the

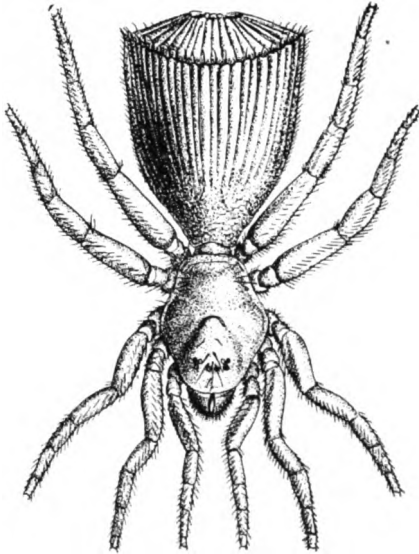


MAP OF SOUTHEASTERN MEXICO SHOWING REGION VISITED BY DR. PETRUNKEVITCH.

Pacific coast of Chiapas. On the other hand, the fauna of the lowlands of Tabasco, Campeche and Yucatan shows some relation to the West Indian fauna, which itself has close relation to the fauna of Venezuela. Thus a study of the fauna of Central America is a clue to the understanding of the insular fauna which represents remarkable features in the West Indies.

I left New York July 1 by the Ward Line of steamers and landed

at Vera Cruz, July 9. The sky was cloudless, and vegetation showed all signs of prolonged drought. During the day the breeze from the sea

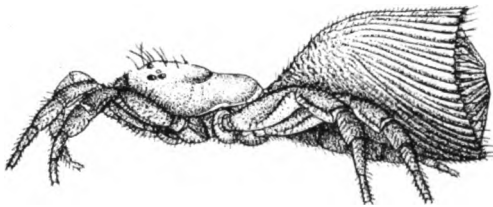


TRAP-DOOR SPIDER CHORIZOPS LORICATUS.

But one other specimen is known.

and is a specialist on palms and orchids. His house is surrounded by a veritable botanical garden of trees and other plants from all parts of the world, while the plantation itself is picturesquely shut in by the jungle.

was refreshing, but each evening this died away leaving the night hot and uncomfortable. After two days at Vera Cruz, I went south on the Vera Cruz al Isthmo Railroad, passing alternately through savannas of mesquite and palms and extensive, beautiful jungles. Leaving the train at the Santa Rosa flag station on the Isthmus of Tehuantepec, an hour's ride brought me to the rubber plantation La Buena Ventura, where it was my good fortune to experience for ten days the hospitality of Mr. J. C. Harvey, one of the owners. Mr. Harvey has extensive knowledge of tropical plant and animal life



TRAP-DOOR SPIDER, CHORIZOPS LORICATUS.

Side view.

Enlarged.



End of abdomen, used as the "trap-door."

Judging from foot-prints, the locality was a good one for hunting jaguar, tapir, wild swine and deer, but I was intent on smaller game. In the depth of the jungle, there is little life on the ground. Along the

trails, however, and at the edge of the woods are great numbers of butterflies and grasshoppers and many species of other insects. During two days, one species of butterfly was migrating high over the jungle in immense numbers. I found two large tarantulas common. There was found also and presented to me by Mr. E. Howard, a specimen of a very rare trap-door spider, *Chorizops loricatus* C. K. There is only one other specimen of this spider known to exist, and that is in the Paris collection.

After leaving La Buena Ventura, I spent four days at Palomares in



E. O. Hovey, Photo, 1906.

SANTA LUCRECIA. A NATIVE VILLAGE ON THE ISTHMUS OF TEHUANTEPEC.

the State of Oaxaca on the Isthmus. Here there is also an extensive jungle, but the character of the vegetation is somewhat different, owing to different soil. It did not, however, afford enough peculiarities to merit a long stay, so I proceeded to San Geronimo. At this place, the country has the character of a semi-desert with mesquite and cactus and very little rainfall. This year, however, about a week before my arrival, an especially heavy rain flooded the land for miles. The water ran off quickly, and soon the heat of the sun caused the soil to crack,

forming crevices in all directions, some of them more than three feet deep and so broad that I could thrust my arm into them. Much of the life of the surface evidently had been destroyed by the water. I found many hundreds of trap-door spiders' nests but all were deserted and ruined.

The most striking and distinctive character of the fauna at San Geronimo seems to be brilliancy of coloring. Thus the black spider, *Latrodectus mactans*, common all over tropical countries, has here broad coral-red stripes which give it an appearance more red than black. The



E. O. Hovey, Photo., 1906.

ON THE JALTEPEC RIVER, ISTHMUS OF TEHUANTEPEC.

black scorpion is replaced by a yellow one, the black and brown tarantula by a species with pink cephalothorax and red-striped abdomen. Specimens of arachnida were abundant, but the number of species was few, so that three days proved time enough to get a representative collection.

My next stop was made at Tonalá, Chiapas. This town is in the rainy belt which begins a few miles to the southeast of San Geronimo and extends along the Pacific coast into Guatemala. In the lowland, it was hard to collect, owing to the great amount of water over the ground from the swollen brooks. One trip only was made through the little

ranches on the plain, and the remaining days were spent on the slopes of the hills about 1200 feet above sea level.

Finally I decided to go to Tapachula and the Guatemalan border — although it turned out that I first had two days of good hunting at a rubber plantation, La Zacualpa, on the way to Tapachula. When we reached Tapachula on the evening of Thursday, August 5, the rain was falling in torrents and did not stop even for a moment until Sunday. We wanted to reach the Guatemalan border from Tapachula and return on



F. O. Hovey, Photo., 1906.

ON THE TEHUANTEPEC RIVER.

the same day, the distance being only some forty-eight kilometers on the Pan-American Railroad, but the country was already so flooded that the train proceeded very slowly. At one place it stopped, and a ditch was made to allow the water to run from one side of the track to the other, while an improvised support was constructed for the rails. Meanwhile the rain began to fall again, and when, late in the afternoon, we reached the last station, about one kilometer from the border, the conductor was so afraid of a washout, since the wheels of the cars were already plowing through water in many places, that after only a twenty-minute wait he

started the train on its backward journey. Therefore on Monday, as I heard that the expected washout had occurred and would take some two days for repairs, I went again to the rubber plantation La Zacualpa.

It was no longer possible to collect anywhere in the jungle. In fact the water was so deep that it was impossible to enter within its borders, except in a canoe. There was plenty of life, however, in the high grass among the rubber trees, and in the period of waiting my collection grew to such an extent that I had to get all kinds of odd bottles to hold the specimens. Wednesday we were told that it would take another two days to repair the washout. We remained at Zacualpa. When on Friday, however, we were told that the washout extended over eighty-eight kilometers of the railroad more or less, that several bridges were destroyed and that some eight days would be required to make the necessary repairs, we decided to go to the last station to which the train was running and there to get horses for Pijjiapam.

It rained nearly all day Friday, and we had to spend the night in a railroad car. Next morning we let the horses swim across the river, while we carried the baggage over a bridge, the approach to which on both sides of the river was dangerous owing to the fact that the track had no support, the ties hanging in the air suspended from the rails. Furthermore, a great amount of brush and logs had been caught by the piers in the middle of the bridge so that it bent perceptibly under the pressure. We walked over this bridge one at a time, then resaddled our horses and leaving the railroad started on the "Camina Reale," or "Royal Highway." Fortunately the rain did not begin until about two o'clock or else we should not have been able to cross some of the rivers that we encountered. In the dry season these are mere brooks, but now some of them were about one hundred yards wide and three to four feet deep and so rapid that many a time we hesitated before urging the horses to enter. During the three days of our ride, we crossed twelve such rivers and more than double that number of smaller streams.

It would be hard to imagine a worse road than this "Royal Highway," the only road between Tapachula and Tonalá. In some places it was many yards wide, in others it narrowed to a mere path. It ran through the woods and the fields of ranches which were separated from each other by miles of beautiful jungle. Where the path was narrow, the water from the recent rains was often two feet deep. In other places the road was so muddy that we had to lift our feet to the horse's neck

to prevent their plowing long distances through the soft clay. Along one part of the road a great number of trees had been uprooted by some storm and lay across our way. To ride around the free ends of these trees necessitated in many cases the use of the machete and in consequence much delay.

It is not surprising that, under such circumstances, we were able to make no more than four kilometers an hour on the average. With our baggage soaked because of repeated crossings of rivers and ourselves so wet that we no longer minded the rain, we arrived on the evening of the first day at Mapastepec where we stopped over night. On the next day we reached Margarita and stopped at a Mexican ranch, sleeping in hammocks in the same wet clothing of our journey. On the third day we reached Pijijiapam and were glad to remain over night in the railroad station. We found that the bridge over the Pijijiapam River had been swept away the twisted rails being washed ashore some hundred yards farther down the stream. The following day we crossed this river, then paid off our guides and waited for a train that was hourly expected. It did not come till late in the evening and proved to be a mere work train, but we were grateful to get under cover from the rain and spent the night in a box car, reaching Tonalá early in the morning.

These days of ride through the jungle were, perhaps, the most interesting part of the whole journey. Not only could we study many recent foot-prints of wild animals, but also we were accompanied for a long time by a crowd of monkeys. They showed no fear and chattered, played and swung from tree to tree looking down on us with curiosity. Red and green parrots were also present in great numbers, and their cry in the evening reminded me forcibly of the distant calling of the European crows, when in large flocks they are looking for a night's shelter. The insect life was abundant and apparently the same as at Tonalá and Zacualpa, but it was impossible to do any collecting under the conditions.

To my great disappointment my collection of spiders from Zacualpa and Tapachula was considerably damaged during this trip. At first I tied the basket containing the jars around my neck and held it on the saddle in front, but after fording the first river, I appreciated the fact that in case the horse slipped, I should not be able to swim ashore with that weight on my neck, so thereafter I fastened my basket to the pack horse. The constant shaking resulted in rubbing many specimens to powder,

and as though that were not misfortune enough, the horse fell on its back in a ditch and broke some of the most valuable vials. Finally, so many had been the mishaps that I felt grateful to see that the entire collection was not ruined.

The rest of the journey had fewer unexpected incidents. I did some collecting at Cordova and in the vicinity of Mexico City. On the way to Texas a flood at Monterey made it impossible to reach San Antonio through Laredo, so a westerly detour was made by way of Eagle Pass. At Austin, I spent a week collecting under very difficult conditions, for the weather had been dry so long that the soil was desiccated and cracked and the insects and spiders were hidden deep in the ground. Professor Paterson of the University of Texas and Professor Brown of the Pease School accompanied me on several of these excursions and most courteously helped in the collecting.

As may be easily imagined, the work of the trip was considerably impeded by the heavy rains and floods which turned the forests of the lowlands into swamps and lakes. With all that, however, the net result of the expedition was large. The collections consist not only of some 2000 specimens of spiders, scorpions and other arachnids but also of more than 400 vials containing many specimens each of myriapods and insects. To this list must be added a few specimens of amphibians and reptiles and a small collection consisting of nineteen Mexican snakes given to me by Mr. Olmstead of Mexico City for presentation to the Museum.

ALEXANDER PETRUNKEVITCH.



E. O. Hovey, Photo., 1906.
TEHUANA TRANSPORTATION

MUSEUM NEWS NOTES.

AT the regular meeting of the Board of Trustees, held on November 8, Dr. James Douglas was elected a member of the Board. Prince Ludwig Salvator was elected a Life Member of the Museum on account of the valuable gift of books noted in the last number of the Journal; Mr. R. R. Cornell was made a Life Member on account of important gifts of the heads of big game and Dr. Hugh M. Smith was elected to Life Membership on account of many services rendered and courtesies extended to the Museum.

IN addition to the gifts already reported in the Journal the following important donations were announced at the Trustees' meeting: A collection of types of North American spiders, received from Dr. Thomas H. Montgomery; one hundred books on angling, from Miss Grace H. Dodge; an atlas of hand-painted plates of Brazilian flowers, from Mr. Anson W. Hard; two hundred volumes on microscopy, from Mr. William G. DeWitt; a head-dress from Abyssinia, from Dr. U. S. Kahn.

SINCE our last issue the following persons have been elected to membership in the Museum: Patrons, MESSRS. JAMES DOUGLAS and GEORGE J. GOULD; Life Members, MESSRS. S. B. CHAPIN, R. R. CORNELL, WILLIAM R. CRAIG, THOS. DE WITT CUYLER, WM. T. DAVIS, LEWIS L. DELAFIELD, A. F. ESTABROOK, ALESSANDRO FABBRI, CHILDS FRICK, JOHN HUBBARD, M. R. JACOBUS, GOODHUE LIVINGSTON, JAMES MCLEAN, EDWARD C. MOORE, JR., VICTOR MORAWETZ, DUDLEY OLCOTT, 2D, J. SANFORD SALTUS, PRINZEN UND HERRN ERZHERZOG LUDWIG SALVATOR, EDWARD SHEARSON, FRANCIS SKINNER, BYAM K. STEVENS, FREDERICK STURGES, F. W. VANDERBILT and HENRY R. WALCOTT, DR. HUGH M. SMITH and MMES. EMMONS BLAINE and SIDNEY WEBSTER; Sustaining Members, MESSRS. H. D. BABCOCK, EDWARD S. HARKNESS, MORTIMER L. SCHIFF, GRANT B. SCHLEY and DELOS O. WICKHAM and MRS. D. C. BLAIR; and Annual Members, MESSRS. JOSEPH A. BLAKE, ALBERT CALMAN, J. B. FRANCIS HERRESHOFF, CARY T. HUTCHINSON, HARRY LA MONTAGUE, JAMES LAUGHLIN, JR., CHARLES L. LEONORI, FRANK J. LOGAN, PHILIP M. LYDIG, J. M. MCCARTHY, WM. McDONALD CHARLES MAC DONALD, MARVIN H. MEAD, HENRY H. MELVILLE, TRUMAN H. NEWBERRY, DUDLEY OLCOTT, GEO. CARD PEASE, VERYL

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THE annual autumn exhibition of the Horticultural Society of New York was held at the Museum from the evening of November 3 to 7 inclusive and was attended by 30,734 visitors. The exhibit was broader in scope than that of last year and was more effectively displayed, being installed in the foyer and the adjacent halls.

DURING the past summer, Dr. Edmund Otis Hovey of the Department of Geology visited some of the iron and copper mines of the Upper Peninsula of Michigan and secured valuable and interesting specimens for our collections illustrating economic geology. Through the kindness of the Oliver Mining Company, its noted hematite mines at Ishpeming were studied in detail and characteristic specimens secured. Through the courtesy of Dr. Alexander Agassiz, President of the Calumet and Hecla Mining Company, a complete series of specimens was collected illustrating the occurrence of native copper in the celebrated mines of that company at Calumet. Through the courtesy of Mr. F. W. Denton, the mines at Painsdale were visited and characteristic specimens were secured.

DR. LOUIS HUSSAKOF, Assistant Curator of Fossil Fishes, recently returned from a five months' trip to Europe. He spent most of his time studying the collections of living and fossil fishes in the leading museums; among others, the Royal Scottish Museum, the British Museum, the Musée d'Histoire Naturelle of Paris and the Berlin Museum. Considerable attention was given to the methods employed in the exhibition and installation of specimens. The last two weeks of the trip were spent in studying and collecting living fishes at the Stazione Zoologica, Naples. Many valuable scientific data were obtained for future publication.

DURING the past summer collecting in the Eocene deposits of Wyoming for the Department of Vertebrate Palæontology was continued by Mr. Walter Granger. His party was four months in the field and devoted its attention principally to the exposures of the Wind River beds of the Lower Eocene formation in the Wind River basin in the central part of the State. This is the formation in which the famous skeleton of the small four-toed horse, *Eohippus*, was found in 1880 by Professor Cope's collectors. Fossil remains are rare in the Wind River beds and usually are fragmentary and badly preserved. They are desirable, however, because they fill an important place in the Eocene history of North America. The collection obtained this season comprises more than four hundred specimens, representing probably all of the forms previously known to occur in the formation as well as several new ones. It will, therefore, considerably increase our collection illustrating early Eocene life.

MR. BARNUM BROWN of the Department of Vertebrate Palæontology returned early in November from a field season spent in collecting in the Laramie Cretaceous rocks of Montana. Mr. Brown was assisted by Mr. Peter C. Kaisen, and their efforts were richly rewarded by securing the major portion of a ceratopsian skeleton besides parts of three skeletons of a new predentate dinosaur from the Hell Creek horizon. Furthermore, much material was obtained which will be used in mounting a skeleton of the three-horned dinosaur *Triceratops*.

THERE has been installed in the new accession cases of the Department of Anthropology (Siberian Hall, southwest corner of the ground floor) a selected series of specimens from the material collected by Mr. Alanson Skinner last summer among the Winnebago, Ojibway and Cree Indians, and by Mr. W. C. Orchard among the Penobscot Indians.

THE twenty-seventh annual convention of the American Ornithologists Union is to be held at the Museum Tuesday to Thursday, December 7 to 9, inclusive.

LECTURE ANNOUNCEMENTS.**MEMBERS' COURSE.**

The following illustrated lectures remain to be given to Members of the Museum and persons holding complimentary tickets given them by Members.

Thursday evenings at 8.15 o'clock. Doors open at 7.45.

December 2.—MR. A. RADCLYFFE DUGMORE, "Camera Adventure in the Wilds of Africa."

December 9.—MR. DONALD B. McMILLAN, "With Peary in the Arctic."

December 16.—DR. HUGH M. SMITH, "The Coast of Brittany and the Industries of the People."

PUPILS' COURSE.

These lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on the presentation of Membership tickets.

Lectures begin at 4 P. M.

Wednesday, December 1.—H. I. SMITH, "Life Among our Indians."

Friday, December 3.—R. W. MINER, "Animals Helpful to Man."

Monday, December 6.—E. O. HOVEY, "Mining Industries of the United States."

Wednesday, December 8.—F. E. LUTZ, "Animals Injurious to Man."

Friday, December 10.—LOUIS HUSSAKOF, "Travels in South America."

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Saturday evenings at 8:15 o'clock. Doors open at 7:30.

The last three of a course of eleven lectures by DR. WILLIAM L. ESTABROOK on inorganic chemistry, illustrated by experiments.

December 4.—"Carbon Dioxide and Ventilation."

December 11.—"The Atmosphere."

December 18.—"Combustion and the Flame."

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Lectures illustrated with stereopticon views.

December 7.—MR. GEORGE NEWTON CROSS, "The White Hills."

December 14.—MR. GEORGE NEWTON CROSS, "City of Washington."

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required. Doors open at 2:45, lectures begin at 3:15 o'clock.

Thanksgiving Day, November 25, 1909. CHARLES H. TOWNSEND, "The Fiji Islanders and Other People of the South Seas."

Christmas Day, December 25, 1909. ALANSON SKINNER, "By Canoe to Hudson Bay."

New Year's Day, January 1, 1910. ROY W. MINER, "Sea Animals of Our Shores."

Washington's Birthday, February 22, 1910. EDMUND OTIS HOVEY, "Some American Mining Regions."

Particularly those producing Coal, Iron, Copper, Gold and Silver.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;
Second Mondays, Section of Biology;
Third Mondays, Section of Astronomy, Physics and Chemistry;
Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;
The New York Entomological Society;
The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;
The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

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UPPER DINOSAUR CLAYS, BASAL SANDSTONE AND CONCRETIONS. GILBERT CREEK, MONTANA

The American Museum Journal

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JANUARY, 1910

No. 1

THE TYRANNOSAURUS

IN the southeast corner of the Dinosaur Hall are the remains of the largest beast of prey that ever lived. This is the *Tyrannosaurus*, the great Carnivorous Dinosaur of the Cretaceous Period. Forty feet in length, with huge and massive skull, the jaws four feet long armed with sharply pointed teeth each projecting from two to six inches from the socket, this monster is beyond comparison the greatest carnivorous animal that ever inhabited the land.

The Museum has been peculiarly fortunate in securing three skeletons of this rare dinosaur. All of them were found by Mr. Barnum Brown of the Department of Vertebrate Palæontology on different expeditions. The first, from near Edgemont, South Dakota, was discovered in 1900 and includes the lower jaws, many vertebræ and ribs and a few bones from the limbs and feet. The second was obtained in 1902 on Hell Creek in central Montana and consists of a large part of the skull and jaws, most of the vertebræ of the back and the nearly complete pelvis and hind limbs. Since then Mr. Brown has searched diligently for additional remains of this animal, and in 1908 he was so fortunate as to find a skeleton in splendid preservation, and perfect except that it lacked the limbs and the tip of the tail. The rock in which these skeletons were found is a loosely cemented sandstone, but the skeletons themselves are partly or wholly encased in great concretionary masses of flinty hardness. Extracting the bones uninjured from these iron-hard concretions is a slow and difficult task and is not yet complete on the third and finest of the skeletons.

The skull and jaws and the pelvis and hind limbs of the second skeleton have been restored and mounted in the hall, as previously noticed in the JOURNAL. The skull and jaws of the third and finest skeleton of the Tyrannosaur have recently been placed in a case beside them. This specimen, which is the first really complete skull of a carnivorous dinosaur known to science, is of inestimable scientific value. It is beyond question the most impressive dinosaur skull ever found and



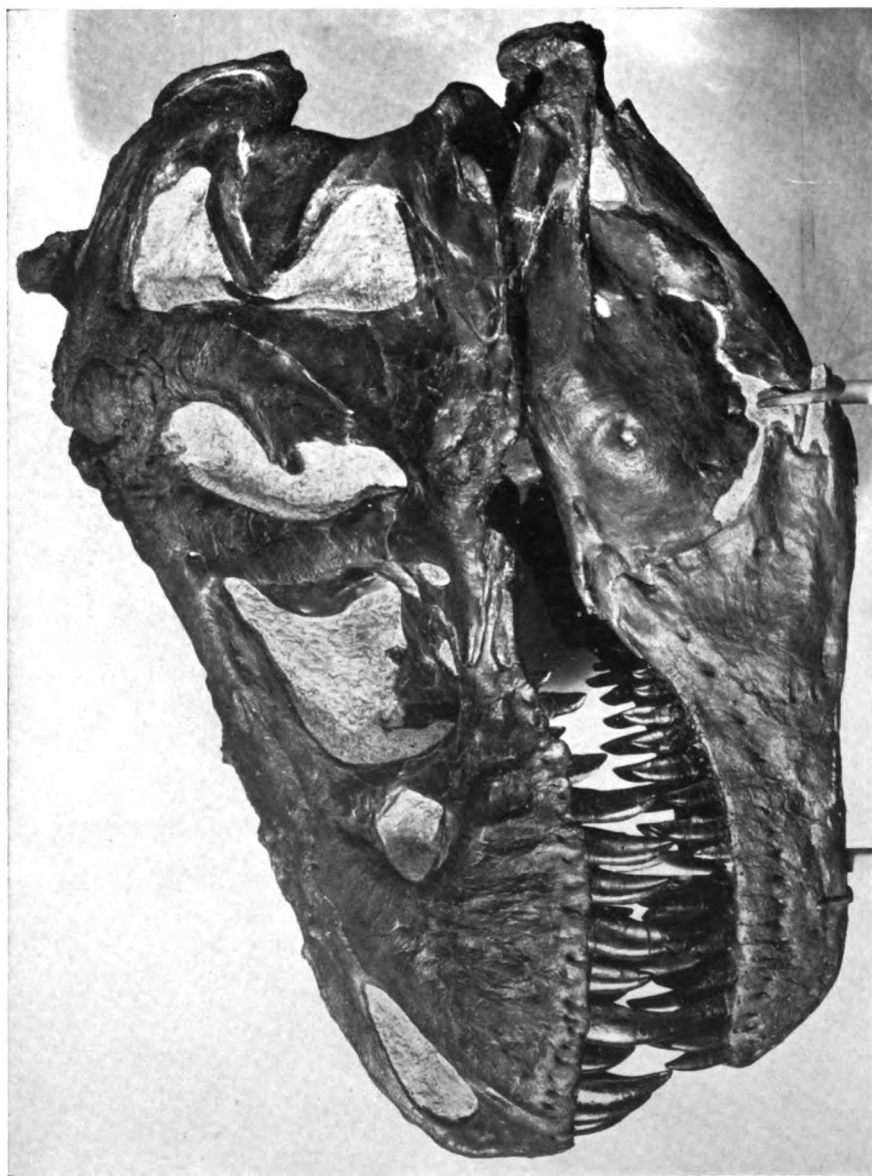
4 TYRANNOSAURUS SKELETON UNCOVERED AND READY TO BE TAKEN UP. BIG DRY CREEK FORTY MILES SOUTH OF GLASGOW, MONTANA



WORKING ON SKULL OF TYRANNOSAURUS. QUARRY FORTY MILES SOUTH OF
GLASGOW, MONTANA



BOXING PELVIS OF TYRANNOSAURUS. TWO TONS IN WEIGHT BIG DRY CREEK, FIFTY
MILES SOUTH OF GLASGOW, MONTANA



TYRANNOSAURUS. MOUNTED SKULL IN MUSEUM



TYRANNOSAURUS. RESTORATION FROM SPECIMENS IN THE MUSEUM

presents several unusual features, notably the distinct sutures which clearly define every element of the skull and the definite size and position of the orbit.

The present arrangement is temporary. As soon as the skeletons can be restored and the missing parts in each modeled or cast, the one from the other, it is intended to make a group consisting of the two Tyrannosaurs standing over the mummied carcass of a Trachodon, a unique specimen which was purchased last year from Mr. Charles H. Sternberg and noticed in the JOURNAL for April, 1908. This group will make a very effective and striking centerpiece for the Hall of Cretaceous Dinosaurs which is planned for the future development of the Museum.

There is no living beast of prey that compares with the great carnivorous dinosaurs or which habitually attacks the largest herbivorous animals. The lion and the tiger prey upon the medium-sized and smaller hoofed animals; they do not usually molest the great "pachyderms" (the elephant and the rhinoceros), and the indefinite multiplication of these giant ungulates is checked by other means. But during the Age of Reptiles it was different. The *Allosaurus* of the Jurassic, the *Tyrannosaurus* of the Cretaceous, were fitted by nature to attack and prey upon the largest of their herbivorous contemporaries; and the size and power of their weapons for attack far surpass anything seen among modern carnivores or those of the Age of Mammals. Conversely the largest herbivorous dinosaurs wore armor or weapons for defense much heavier and more powerful than can be found among the great pachyderms of modern times, whose thick skin is mainly a protection against accidental injury or the attacks of insects. The great horns and bony neck-frill of *Triceratops* and the armor-plated head and body of *Ankylosaurus* were developed no doubt to resist the attacks of the huge Tyrannosaur. Other contemporary dinosaurs like *Trachodon* were unarmored but were evidently adapted to a more amphibious life and sought refuge in swimming beyond the reach of their great enemy. Others again of much smaller size were agile and active and probably escaped by superior speed.

MR. GEORGE S. BOWDOIN, one of the Trustees, has presented to the Museum a fine old native basket from the Hope Islands in the South Pacific Ocean.

A VISIT TO THE OJIBWAY AND CREE OF CENTRAL CANADA

A BAND of Ojibway Indians occupies that region of central Canada lying between Hudson Bay and the Great Lakes, and a band of Cree lies directly north of them. These tribes it was my good fortune to visit during the past summer, sent by the Department of Anthropology of the Museum. On the first day of June starting from Dinorwick, the little Hudson's Bay Company post some 200 miles east of Winnipeg on the Canadian Pacific Railroad, I began the expedition accompanied by two guides, one of whom, Tom Bain by name, was head-guide for the Museum's expedition into the James Bay region in 1908. Our equipment was light, consisting merely of a tent and blankets, food, guns and necessary ammunition. These we carried nine and one half miles to Sandy Lake where we loaded them into an eighteen-foot cedar canoe, our bark for the remainder of the trip.

From Sandy Lake we journeyed four days northward to Lac Seul, touching at several Ojibway villages and camps by the way and coming in rather dangerous proximity to a serious forest fire. We made our first permanent camp at Lac Seul. About eight hundred Ojibway trade at this point, and at first they were inclined to be suspicious of us. They became decidedly hostile and threatening after they learned that our object was to study their manners and customs, so that, although we spent about ten days among them, we were able to secure little information and but few specimens.

At length, finding that our efforts were bringing no results, we set out for our next stopping place, Fort Osnaburgh on Lake St. Joseph, but after a day's paddling found that the guide did not remember the route. We were obliged to return to the Lac, which we reached a little after midnight. For some time before nearing our camping ground we could hear the Indians drumming and singing back in the woods, and after we pitched our camp not far away from where the Indians were, we could hear very distinctly what was going on. The medicine man or shaman was making medicine against us and particularly against me. His incantations, however, proved of no avail, at least we can truthfully say that we have felt no ill effects from his charms as yet. The following morning, we secured a friendly Cree who was living among the Ojibway at this point to guide us on our way to Fort Osnaburgh. The journey

from Lac Seul to Fort Osnaburgh led through the Root River, across the Height of Land into Lake St. Joseph.

The Root River although quite deep is a sluggish stream and narrow most of the way, varying from five to fifty feet in width. Moose, caribou and deer frequent its low and swampy shores. On our first day out we saw a yearling cow moose on the bank, and a shot from my carbine put us in possession of a much needed supply of fresh meat. On the following day we saw two more moose, and owing to the skillful and



YORK BOAT ASCENDING THE ALBANY RIVER

Supplies from Europe for the Hudson's Bay Company are still sent around Labrador into Hudson Bay, a journey of many months.

silent paddles of the Indians, were able to approach within fifty feet of one of them before she saw us. The day after, we again saw two moose and on the following day another pair. The last moose which we saw was an immense bull, and his horns, which were still in the velvet, were of enormous size, though it was only the middle of June. During the long time that we watched he remained in the middle of a small round basin caused by an expansion of the river and was evidently feeding on roots or weeds beneath the surface of the water. Sometimes he sank completely out of sight, even the ridge of his back disappearing from view.

My men stated that this was most unusual, though Bain said that he had once before seen a moose go completely under the water.

We found the Indians at Fort Osnaburgh also inclined to be hostile. The band at Lac Seul had sent warning messages that they were to have nothing to do with us, as our purpose in coming to their country was to steal little boys. The fact that I wore spectacles also militated against me, as the Indians believed that my glasses could see completely through them and read their thoughts. The Hudson's Bay Company had suspected several Indians of various petty misdemeanors and these Indians showed their guilty consciences by moving away as soon as we arrived. After some effort, however, we managed to come to friendly terms with these people and gained some results here.

From Fort Osnaburgh we left Lake St. Joseph and descended the Albany River, about four days' journey, when we turned aside and entered Lake Fabamet where the Hudson's Bay Company has long had a post known as Fort Hope. At Fort Hope there had been listed by Government census 513 Indians who were drawing annuities of four dollars each for England's use of the Canadian territory, but the epidemic of influenza which swept the Indians of northern Canada last year had carried away eighty of them during the winter.

We arrived at this place just before the Government men who were to pay the Indians their annuities. Hence we found the Indians all



"PACKING" ON THE MISSANABIE RIVER

All goods and specimens must be transported in this manner part of the way in the forest.



GOVERNMENT PAYMASTER DISTRIBUTING ANNUITIES TO THE FORT HOPE INDIANS



FEAST FOLLOWING THE RECEIPT OF ANNUITIES

The men form the inner circle, while the women and children sit outside

gathered in camp around the Hudson's Bay Company's and Revillon Frères' stores. These Indians also were afraid of us, as they had been warned by messages sent from Lac Seul as to our kidnapping propensities. I almost immediately got myself into difficulty by giving a ten cent piece to an attractive baby. A council was called at once to determine whether I was attempting to charm the child to death or not. But the missionary and the Hudson's Bay and Revillon Company's factors got word of it, came to Fort Hope and persuaded the Indians that our intentions were not bad.

The Indians decided, however, to send for their most noted shaman, Waboose-Inini or "Rabbit Man." The old fellow was hunting some distance from the Fort but put in his appearance a few days later, camping about three miles outside of the Post. He immediately sent word to me that he wished to see me. To this I replied that I was very busy and could not bother with coming. A second messenger shortly arrived inquiring why I was so busy that I could not see so great a man as Waboose-Inini. My reply was that I was learning all about shamanism from another medicine-man — a rival whom we knew the old fellow did not like. Waboose-Inini arrived next morning at our camp and we kept busily employed writing in our notebooks all the morning, while the old man sat about smoking. Toward noon he would have departed, but I asked him to stay for dinner, and on the following day the old man appeared again about meal time. This time he was not only invited to stay, but I gave him something to eat from my plate. He told me that no white man had honored him so before. When on the third day, he happened around at the noon hour and was again invited to dine, his delight knew no bounds and he burst out with, "Tell the young white chief that if there is anything he wants to know, I will tell him. I know everything. These other people are nothing but old women. I am the only one about here who knows how to make medicine."

After this, we were on most friendly terms and the other Indians seeing that I was accepted by the shaman also became friendly so that we were able to secure many photographs and quite a collection of specimens, notwithstanding that the Indians were at first afraid of the camera and in spite of the fact that most of the old customs have gone out within the past fifty years.

Few of the Northern Indians now seem to practise their ancient culture, in fact, they are much less primitive in many ways than our own



ANGLICAN CHURCH MISSION AND INDIAN VILLAGE, FORT HOPE, KEEWATIN



THE MISSION SCHOOL AT FORT HOPE

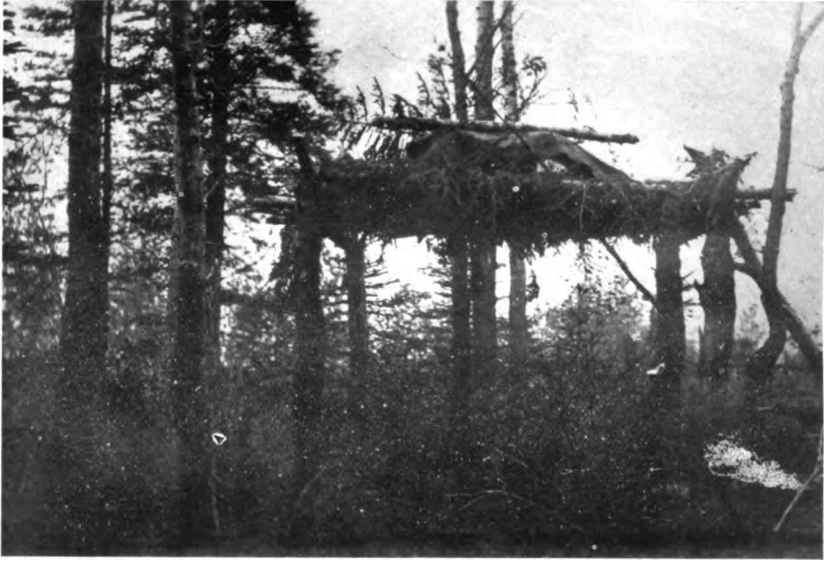
Ojibway children are still taught their own language by the English missionaries



OJIBWAY LADS. FORT HOPE



OJIBWAY MOTHERS AND BABIES. FORT HOPE



EASTERN CREE "CACHE." BLACK BEAR POINT, JAMES BAY

Supplies placed on scaffold out of reach of dogs and wolves.

reservation Indians who have been in contact with the white people for so many years. The reason for this is twofold. In the first place, most of the tribes in the United States were by nature warlike, while those of the north were hunting peoples, gentle and rather timid in character. In the second place, our Indians have been surrounded by a great number of white people who came among them as enemies. They have been isolated in groups among people whom they dislike. For this reason they have striven to preserve their identity as Indians, in so far as that was possible. In Canada, on the other hand, the white people in the northern district are still greatly in the minority. They have come among the Indians slowly and have come as friends. The Hudson's Bay Company has done a great deal toward rendering the existence of the Indians less difficult. White men's clothing, good food, implements and many other useful things have been given in exchange for fur. The side of the white man which the Indian has seen is an admirable one and worth striving to imitate in every way.

While we were at Fort Hope, the Indians were visited by Government treaty representatives. The arrival brought about much rejoicing on the part of the Indians, exhibited in firing of guns and in daily feasts

and dances. At this time the Indians received the only medical attention which they will have until another year has passed.

After a stay of several weeks at Fort Hope, we decided to leave. Old Rabbit Man seemed very sorry to see me go and, wishing no doubt to do the proper thing, decided to present me with his small daughter, a girl of about eight years of age. Needless to say, I was somewhat embarrassed by this and asked why I was so honored. "Make you fine wife," replied the old fellow. "But she is too young," I replied. "That makes no difference, my friend," said Rabbit Man. "Take her now. Bring her up right. She will love you all the more when she gets older." I finally explained that I was a poor young man and did not catch many beaver and was not in any position at



WIGWAM AT FORT HOPE

The bark wigwam is still occasionally constructed by the Eastern Ojibway.

the present time to support a young lady in proper state. The old man was satisfied and we proceeded on our journey.

Below Fort Hope, along the Albany River as far as Martin's Falls we caught beautiful trout but saw little game. From Martin's Falls we passed down to Fort Albany on James Bay, then coasted Hudson Bay for 120 miles to Moose Fort. Immense flocks of ducks, plover and various water and shore birds were frequently encountered. On one occasion we ran into a herd of white whales which sported about the canoe. My men shot ducks and geese to help out our provisions, and in addition, killed several hawks which they roasted and ate and which, to my surprise, proved quite palatable.

The journey up the river was rather uneventful, except that I was fortunate enough to kill a yearling bull moose about 150 miles south of the Bay. This was the first fresh meat that we had had since the moose I killed on the Root River some two months before. Incidentally, it may be said that we had no vegetables from the time we went in until the time we came out. After a return journey of sixteen days on the Missanabie or Moose River, we arrived at Missanabie on the Canadian Pacific Railroad August 27.

It appears that the Ojibway visited once lived in a neighborhood considerably farther south, possibly in northern Minnesota, whence they pushed northward, almost to Hudson Bay. Since coming to the North, they have not only given up many of the manners and customs of the typical Ojibway of the south but have also taken on some of the customs of the Eastern Cree. In addition they have evolved some new points of culture distinctively their own. All of these factors set them off as a distinct and separate body from the well-known historical Ojibway.

There was secured upon the expedition a series of the articles of aboriginal manufacture now used by the Cree and Ojibway of the Hudson Bay Region. These articles consist of household utensils, games, clothing and a few ceremonial articles. At the same time, full notes on the ethnology and folk lore were made, and the results will soon be published.

ALANSON SKINNER.



MOSS AND BALSAM BOUGHS FOR BEDDING. RUPERT'S HOUSE, JAMES BAY.

MINERAL ACCESSIONS

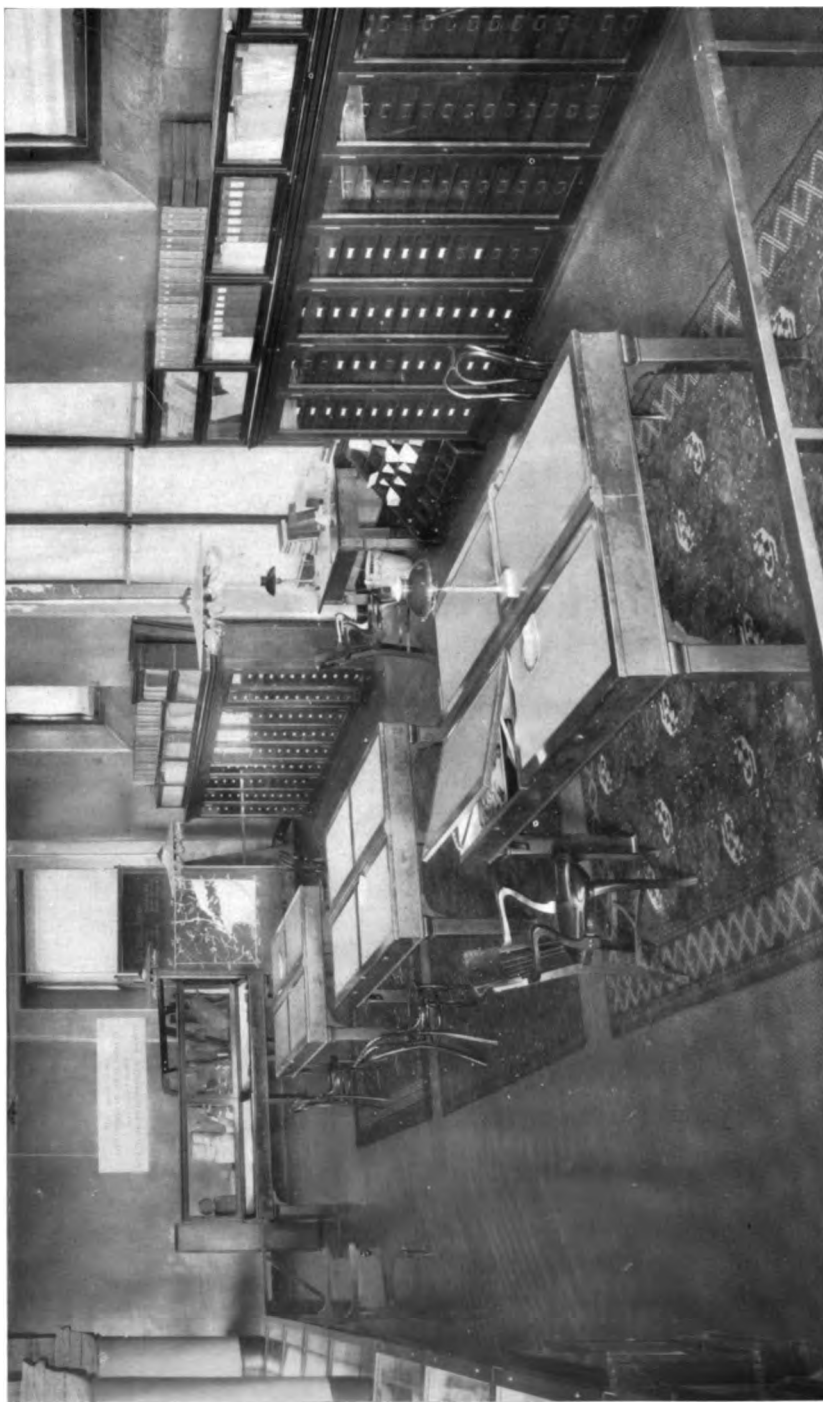
THROUGH the Bruce Fund the Mineral Collection has received some attractive mineral specimens, including several species new to the collection and others from new localities or of unusually perfect crystallographic development. Among the specimens is a group of Iodyrite crystals from Tonopah, Nevada, illustrating some of the hemimorphic forms described recently by Kraus and Cook, a handsome surface of dark-green prismatic Brochantite, a hydrous sulphate of copper, from Chili and a striking veinlet of the same mineral in fibrous form which has been changed to red oxide of copper (Cuprite), possibly, in a measure, through the agency of heat.

Among the remarkable mineral developments at Chuquicamata, Chili, which furnishes the Brochantite, are very beautiful light-green pyramidal crystals of Kröhnkite, and the collection has secured an admirable example of this unique occurrence. Less noteworthy though valuable are some specimens of minerals which possess individual interest for crystal perfection, and among these may be mentioned a handsome Apatite from Hebron, Maine, which for a long time remained an unattainable ornament of a private collection, a small perfect Spodumene (Kunzite) crystal in its matrix, a New Hampshire Topaz and Phenacite, a beautiful blue Topaz from a new locality in Texas, some ruby Corundum from North Carolina, translucent crystals (viewed through the shorter axis) of Phlogopite from Franklin Furnace, N. J., and a delicately arborescent native Silver. In addition to these, specimens helpful for the scientific illustration of their respective species have been purchased, and the collection sensibly maintained abreast of the rapidly increasing development of the subject, through this indispensable endowment.

L. P. GRATACAP.

THE LOCAL COLLECTION OF INSECTS

THERE are about ten thousand species of insects occurring within fifty miles of New York City, but up to the present year, owing to the pressure of other work and the lack of funds, the Museum collection representing these insects attained to only twenty-five per cent



NORTH SIDE OF INSECT GALLERY

Collection of Local Insects. Meeting Room of the New York Entomological Society

of this number. Now efforts are being made not only to complete the collection, but also to install it in a way convenient for use, so that it may be of value as an aid in the difficult task of identifying specimens and as a record of this branch of the local fauna.

Considerable collecting was done during the past summer to help fill up the gaps in the series, and now the New York Entomological Society has kindly undertaken to assist in the work. In fact the custody of the collection has been turned over to the Society, which has chosen a curator whose duty it is to care for the specimens and to attend to keeping the records. Several times a month members of the Society meet at the Museum and spend the greater part of the day working over the collections, adding from their private collections the species which are lacking and seeing that all specimens are correctly identified and labeled. The importance of the work that they are doing cannot be overestimated. When one realizes that within fifty miles of New York City there are still more than seven thousand species of insects which are not represented in our collection, it will be seen what a task has been undertaken. Considerable progress, however, has already been made. Messrs. Angell, Bischoff, Dow, Englehardt, Harris, Joutell, Løng, Schaeffer and Wintersteiner are taking up the Coleoptera group by group, and of the one hundred twenty-five species which they have considered the local collection now contains one hundred eleven, whereas it formerly contained only eighty-three. Messrs. Comstock, Pollard and Watson are paying particular attention to the Lepidoptera; Dr. Love has undertaken the non-parasitic Hymenoptera; Messrs. Barber and Olsen, the Hemiptera, and Mr. Davis has already straightened out the Orthoptera and Odonata and expects to arrange the lower orders. Thus it will be seen that with the exception of the Diptera and the parasitic Hymenoptera the local insect collection is in the hands of men well competent to take care of them.

In connection with the work and to facilitate the study of the local collection some important alterations have been made on the north side of the gallery of the Insect Hall. The collection has been taken out of the open exhibition cases and put into light-proof cabinets along the side of the hall. Reference books and instruments have been provided and cork-topped tables in which are lockers where students may keep their material. Visitors desiring to consult the collection now may do so by asking the attendant to unlock the cabinets for them. The valuable

library of the Museum and that of the Entomological Society are available for convenient reference.

The space in the exhibition cases formerly occupied by the collection of local insects is being filled with exhibits aiming to show both the practical and theoretical sides of entomology, particular emphasis being laid upon insect ecology, or relation to the factors of environment.

RECENT ACCESSIONS TO THE DEPARTMENT OF GEOLOGY

THE Department of Geology is fortunate in having received recently as a gift from the Delaware, Lackawana and Western Coal Company, through its president, Mr. E. E. Loomis, a fossilized tree stump from the Diamond vein of one of the anthracite coal mines under the city of Scranton, Pennsylvania. The thickness of the coal in this vein was eight feet and its top was seventy feet below the surface of the ground. The vein was exhausted here thirty-five years ago and no mining has been done since. Recently one of the mine officials was examining these old workings and on top of the refuse on the floor of the gallery discovered the fossilized stump of a tree in perfect condition. The trunk was probably more than two feet in diameter and the spread of the remains of the roots is more than ten feet across. The stump evidently dropped from the roof some years after mining had been finished, and the specimen was apparently unnoticed when active operations were in progress, since the bottom of the fossil conformed to the roof line of the workings. The cavity from which the stump dropped shows that the trunk of the tree stood in a vertical position.

Through the generosity of Dr. Charles E. Slocum of Defiance, Ohio, a Life Member of the Museum, and with the coöperation of the Kelley Island Lime and Transport Company, we have been able to extract from the quarries at Kelley's Island, Ohio, and transport to the Museum a splendid block about 8×10 feet in size representing the glacial grooves for which the Island is famous. Several deep grooves traverse the block, the principal one of which is about 12 inches deep. The higher parts of the surface show glacial scratches at an angle to the deep grooves, indicating a change of direction of movement in the ice during the latter part of its history or the work of a glacier advancing from a different center. Portions of the surface are polished almost as highly as they would be if the work had been done by hand.

SCIENTIFIC PUBLICATIONS DURING 1909

THE scientific publications of the Museum consist of the MEMOIRS, the BULLETIN and the ANTHROPOLOGICAL PAPERS. The wide range of research carried on by the Museum is indicated by the titles of the articles comprising the volumes as given in the following list. Although these articles are technical in character many of them have general as well as scientific interest. They are issued separately and with the exception of those marked with an asterisk may be obtained from the Librarian. Those which are marked with an asterisk are published by E. J. Brill, Leiden, Holland, and are not on sale at the Museum. They may be obtained through G. E. Stechert, Bookseller, 129 West 20th St., New York City.

MEMOIRS.

Anthropology.

- VOL. IV, *PART VII.—The Shuswap. By JAMES TEIT. Pp. 443-789, pll. xiii-xiv and 82 text figures.
 VOL. VIII, *PART II.—The Kwakiutl of Vancouver Island. By FRANZ BOAS. Pp. 301-522, pll. xxvii-lii and 142 text figures.
 VOL. XI, *PART III.—The Chuckchee: Social Organization. By W. BOGORAS. Pp. 537-733, pl. xxxv and 1 text figure.

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- VOL. IX, PART V.—Studies on Fossil Fishes (Sharks, Chimæroids and Arthrodires). By BASHFORD DEAN. Pp. 209-287, pll. xxvi-xli and 65 text figures.
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- *The Anatomy of the Common Squid. By LEONARD WORCESTER WILLIAMS. Pp. 1–87, pll. i–iii and sixteen text figures.

MUSEUM NEWS NOTES.

THE Department of Vertebrate Palæontology has received as a gift from Mr. Charles Lanier, one of the Trustees, a skull of the great Cretaceous dinosaur *Triceratops*. This specimen was collected in the Laramie Cretaceous of Seven-Mile Creek, Western County, Wyoming, about 45 miles northwest of Edgemont, South Dakota, by

Mr. Charles H. Sternberg and is considered the second finest example ever discovered.

THROUGH the bequest of Miss Phebe Anna Thorne, the Museum is to receive ten thousand dollars for its permanent endowment. The income of the fund is to be used in such a manner as to perpetuate the memory of her father.

THE path of Halley's comet has been added to the planetarium in the Foyer, and the position of this transient visitor to the solar system will be indicated daily during the next few months, while the comet is visible to the unaided eye.

THE Department of Anthropology has recently been enriched by the accession of two large local collections. The first of these was made on Manhattan Island by Messrs. Calver and Bolton. It is particularly valuable, because the sites on the upper end of the Island, whence the objects were obtained, are fast becoming obliterated. Several skeletons are particularly interesting as being the only authentic remains of the Manhattan aborigines known. There is also a large and perfect pottery vessel of the Iroquoian type from the upper end of Manhattan Island. This collection was described and many of the objects figured by Mr. Bolton in Volume III of the "Anthropological Papers" and in the Hudson-Fulton number of the JOURNAL for October, 1909. The second collection was made on Staten Island during the years 1900-1909 by Mr. Alanson Skinner of the Department of Anthropology and is the largest and most complete in existence from this locality, consisting of nearly 1200 specimens. The collection is described and figured by Mr. Skinner in Volume III of the "Anthropological Papers," and in the JOURNAL for October, 1909. Figures 9, 10, 11 and 12 illustrate specimens largely drawn from this collection.

SINCE our last issue the following persons have been elected to membership in the Museum: Sustaining Members, Messrs. ERNEST C. BLISS, TEMPLE BOWDOIN, WM. H. FISCHER, GEORGE COE GRAVES, WALTER C. HUBBARD, ALBERT TAG, F. D. UNDERWOOD and EGERTON L. WINTHROP; Annual Members, Messrs. FRED'K GIRARD AGENS, G. L. BOISSEVAIN, A. H. CASPARY, F. R. HAZARD, WALKER D. HINES, MINOR C. KEITH, MORRIS KINNEY, ANTHONY R. KUSER, GEORGE A.

LAVIE, WILLIAM W. LAWRENCE, JAMES MARWICK, JOHN NEILSON, CLARENCE PORTER, JOHN F. THOMSON, JULIAN R. TINKHAM and WILLIS D. WOOD, Dr. A. BLAIR THAW, Mmes. GEORGIA C. HUDSON, and RAYMOND VON PALMENBERG and Miss THEODORA WILBORN.

LECTURE ANNOUNCEMENTS.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30.

The first four of a course of five lectures by MR. CHARLES M. PEPPER on "The Twentieth Century South America."

January 4.— "Panama to Patagonia."

January 11.— "Argentine, the World's Wheatfield."

January 18.— "The Vastness of Brazil."

January 25.— "Colombia and the Andes."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of six lectures by PROF. JOHN C. OLSEN on "Pure Foods and their Preparation."

January 8.— "Food Values; Cereals and Their Products."

January 15.— "Milk and Milk Products."

January 22.— "Bacteria and Preservatives."

January 29.— "Fats and Oils."

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required. Doors open at 2:45, lectures begin at 3:15 o'clock.

New Year's Day, January 1, 1910. ROY W. MINER, "Sea Animals of Our Shores."

Washington's Birthday, February 22, 1910. EDMUND OTIS HOVEY, "Some American Mining Regions." Particularly those producing Coal, Iron, Copper, Gold and Silver.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum during January as usual.



TOTEM POLE, RIVERS INLET

The American Museum Journal

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No. 2

A VISIT TO THE INDIAN TRIBES OF THE NORTHWEST COAST.

ON an expedition along the northwest coast of America, between Seattle and Skagway, I was able to resume during the past summer the archaeological reconnoissance which I began on the Jesup North Pacific Expeditions of 1897-8-9, and continued on that of the American Museum in 1903. I carried this reconnoissance onward from the northern end of Vancouver Island, where work stopped on the previous expeditions, to Kluckwan, Alaska, some twenty-five miles above Haines on the Chilkat River; obtaining also photographs and other data regarding the ethnology of the region and securing specimens not already represented in the Museum collections. I was accompanied by Mr. Will S. Taylor, mural artist, who made color sketches of the Indians and their natural and artificial environments. These sketches, together with the photographs and the actual ancient costumes and other specimens available in the Museum, will form the basis upon which Mr. Taylor will build up mural decorations for the Hall of Northwest Coast Ethnology, to illustrate the home country, characteristic occupations and social customs of the seven great groups of northwest coast natives.

The scientific results of the trip are interesting because the archaeology of the entire coast north of Vancouver Island as far as Mt. McKinley has been unknown to the scientific world. In the Bella Coola valley about midway along the British Columbia coast I saw chipped implements, marking the farthest north of the art of chipping stone in British Columbia. Evidences were also found here of the relation of the early people to those of the interior. The Bella Coola Indians have apparently pushed down from the interior and crowded in between the peoples already firmly established on the Coast, taking up the coast customs and ways of living very completely. Their language, however, has remained distinct from those of their new neighbors, the nearest peoples speaking the same type of language being found in the interior.

Although the Indians have given up much of their old life and seem

greatly changed even in the twelve years since my first visit, we could still find many purely native manufactures among them. Pictures bruised on the rocks by some of the ancient Indians were seen near Wrangel. In the vicinity of Old Metlakatla, Port Simpson and along the Chilcat River, we found ancient village sites, some of them indicated by the heaps of shell and other refuse discarded for many generations. On the Nass River also was an ancient village site where the Indians still go for eulichon or candle fish. In March these fish ascend the river in great schools and are taken with nets and rakes. The fish are very good food and are so fat that formerly they were used for candles. The Indians' chief interest in eulichon, however, lies in the oil that may be extracted from them, which is considered a luxury and is used as we use butter.

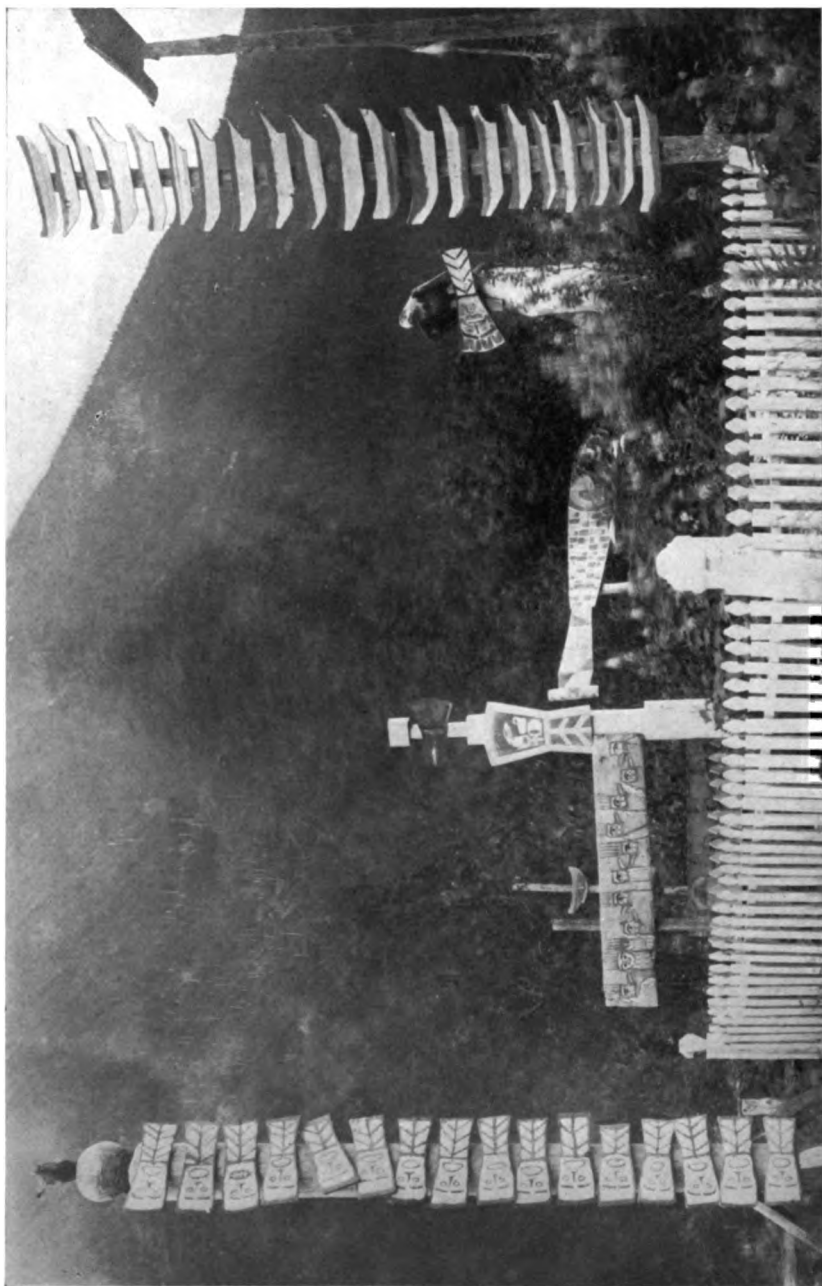
Our first stop of any length was at Victoria, a town perhaps more typically English than any other in North America. The Indians here have been little disturbed, so that even near the city both the southern Salish and the Nootka groups may be studied. Among the interesting photographs and sketches made here were one of an Indian making a dugout canoe from a cedar tree, and one of a Nootka man carving a totem pole.

From Victoria we went by steamer to a small island near the northern end of Vancouver Island, where at Alert Bay there is a tribe of the Kwakiutl. In spite of the influence of several other races living and working in their midst the Indians of Alert Bay in many ways keep to their old methods of living. For instance, although there has been a missionary here for a long time he has not been able to stop burial in tree-tops. The Indians must have practised this custom very recently, as some of the bodies were doubled up in common cheap trunks which can be bought only in the white man's store and are of a sort not made till a few years ago. In the older graves the bodies were placed in boxes made of three pieces of wood split from red cedar. One of the pieces served as the bottom, another as the top and the third was notched and bent around to form the ends and sides of the box. Where the edges of the boards met they were sewed together with spruce roots. Sometimes the boxes were painted and occasionally both painted and carved with the characteristic animal pictures of the region.

Some of the Indians bury their dead in the Christian cemetery, but even then show remnants of old customs. Near one of the graves a fine



GRAVES IN TREES, ALERT BAY



Wooden representations of "coppers" and canoes indicative of wealth and hospitality of the deceased

bureau stood in the wind and rain. Perhaps it had been owned and highly regarded by the woman interred or had been something that she had longed for and now that she was dead her relatives were showing the greatness of their grief by sacrificing a valuable piece of property to the elements. The Indians often erect beside the graves curious monuments such as wooden representations of "coppers," as is shown in the illustration on page 34. These coppers are pieces of metal of distinctive shape and markings. They are of no great intrinsic value, but



TOTEM POLES, ALERT BAY

when bought and sold among the Indians they increase to almost fabulous worth. When a copper is transferred there is always a gathering and a feast. The Indians value a copper so highly that the white store keeper takes the piece of metal as credit and advances groceries and dry goods to the Indians for perhaps a whole year until they are able to go to the cannery and earn money. On coming back from the canneries the Indians always redeem their copper securities and again use them, buying and selling them at enhanced values and with special ceremonials.

From Alert Bay the expedition moved northward to Rivers Inlet, where lives another tribe of the Kwakiutl Indians. There are two villages, one near the Rivers Inlet cannery at the head of the inlet, the other on an island about three miles up stream. Here the river reaches the tide water between tall mountain peaks, still covered with snow in July. At this season of the year the Indians congregate here to work for the salmon canneries. There were Nootka from the west coast of Vancouver Island and also members of the Kwakiutl tribe from Alert Bay. The local Indians with characteristic hospitality invited the visiting Indians to a feast or "cultus potlatch." It was held on Saturday night, when, according to the laws of British Columbia, fishing must not be carried on. We expressed a desire to attend this potlatch, and from time to time during the day, the Indians invited us and reminded us of the event. The chief of the local tribe was very sick and was expected to die. His retainers were going to give the potlatch, so that honor would accrue to him. I am inclined to think that they had a vague idea that it might be of benefit also to his health.

As the darkness gathered the Indians began to move toward the main house of the village. The house was immense and was made of split cedar slabs on a framework of great logs. The rafters, which were just out of reach, were at least three feet in diameter and blackened by the smoke of many years. When we entered this house there seemed to be at least a hundred Indians assembled. At the farther end were the members of the small tribe located at Rivers Inlet. These Indians later furnished music, by beating upon a board with batons and upon a great wooden drum with the fist. Along the left side of the room were gathered the Nootka, and on the right the Kwakiutl from Alert Bay. Some of the men of the latter tribe had positions of honor in great wooden seats which were placed on the floor, where they reclined with their feet toward the fire, their knees partly drawn up and their heads and shoulders resting against the back of the seat. Before the feast began, cordwood was heaped on the fire which furnished the only illumination. When the fire flared up, long shadows were thrown against the blackened walls. Occasionally a dog passed in front of the fire and his weird shadow was thrown against the wall. Sometimes there was a silhouette of a baby, who toddled toward the fire from his mother, only to be drawn back by a clutch upon his skirts. As the evening wore on these children became fretful, and the affectionate

character of the Indians was shown by the way in which the little ones were treated. Some of the older men, in accordance with their rank, preserved the proverbial Indian dignity, but there was enough laughter throughout the assemblage to convince one of the mistake of the popular notion that the Indians are always morose.

At first there was a speech in Kwakiutl by a chief from Alert Bay, in which I caught occasionally the name of the superintendent of the cannery. Then there was a similar speech with much gesticulation by a young man of the Nootka. This was interpreted in Chinook, and since I could understand this jargon, I realized that the Indians were having a labor agitation. Other canneries had been paying bounties to secure the Indians to work for them, and the Indians wanted five dollars for each one who had come to work at the Rivers Inlet cannery. They also thought that the women who put the salmon into the cans were not paid enough. They finally decided not to go out to tend the nets, unless the wages of the women were increased and the bounty was forthcoming.

After the speeches came a dance by the daughter of the chief. She was gorgeously costumed, looking like an oriental princess in a red robe decorated with rows of pearl buttons. She wore a carved and painted headdress, in which were sea lion whiskers carrying eagle down, and which had many ermine skins that hung down her back. The dance was simple and was of short duration, but the mere appearance of so distinguished a person seemed to be considered a great honor. This dance was followed by others, after which the two masters of ceremonies, old Indian neighbors of the owner of the house, brought in a curiously-gowned personage, wearing a grotesque carved and painted wooden mask. This individual followed his leaders part way around the fire, threatening them in screeching tones apparently made with a whistle. Finally, as though out of patience, the Indians turned on him and drove him back a little distance, but he retired with dignity, turning his back upon them. This operation was repeated, until he had gone around the fire several times, when he disappeared with many screeches through a little door at the back of the house, behind the blankets of the masters of ceremonies.

During this performance the fire caught in the roof of the house, but there was no panic among these people, noted as a race for their stolidness. Presently a pail appeared lowered on a rope from the roof. The pail was filled with water and pulled to the ceiling and the water

dashed onto the fire. This was kept up until the fire was out, but the people paid no attention to the interruption, and the dancing and other ceremonies progressed as if nothing unusual were happening. Finally, great cans of tea that had been brewing in the edge of the fire and pilot



CARVED POST. BELLA COOLA

Purchased for the Museum

bread from twenty-eight cases, some of which we had been using as seats, were brought forward, and the cultus potlatch was on.

A real potlatch is a function consisting of the giving out of property as an investment and with the purpose of gaining aristocratic position

in the tribe. The people of this coast formerly were very much given to holding potlatches, but the government officials and missionaries believed that the ceremonies entailed a wasteful throwing away of property and were accompanied by many indiscretions and by much gambling and intemperance, so that a law was passed some years ago making the giving of a potlatch a criminal offence. I am informed now, however, that the cases are thrown out of court by the judges as being unconstitutional or else out of their jurisdiction. Blankets are usually distributed at such potlatches, not only those belonging to the person holding the potlatch, but also those of his relatives, friends and retainers. Sometimes the potlatch is for the benefit of children, so that they will have a certain prestige when older. This sort of a potlatch may be compared to our endowment insurance. The cultus potlatch, however, from which no direct return is expected, may be likened to a dinner or banquet among our own people. So the visiting Indians at Rivers Inlet were given pilot bread and tea to uphold the honor and hospitality of the local tribe.

We next went to Bella Coola, at the extreme eastern end of Burke Channel, about sixty miles inland beyond the usual course of steamers. The Bella Coola River is building out a delta here, so that steamers have to land at a wharf at least a mile long. The outer end of this is only a few feet from the steep mountain side to the north and follows along it until the low delta land is reached. On the end of the wharf is an open shed where all freight is placed until called for by the owners. This shed is never locked, yet nothing is ever stolen from it.

The population of Bella Coola is scattered through the valley and is made up of Norwegians, Indians and Canadians. There is an Indian village on each side of the River. The one on the north consists of Christianized Indians who have settled here, leaving the pagan Indians on the south side. The houses in the Christianized village are similar to those of the white people of the vicinity. Near the pagan village dwell Mr. John Clayton and his family. He is the venerable Hudson's Bay man who keeps the store and is one of the richest and best known men living on the coast of British Columbia north of Vancouver. In the Christianized village are the church and the home of the missionary, the Rev. W. H. Gibson. Both Mr. Gibson and Mr. Clayton were instrumental in assisting us to secure totem poles for the Museum.

On both sides of the valley the mountains rise abruptly, the upper portions rocky, the lower portions heavily timbered with spruce, hemlock,

cedar and fir, as is also the valley. The mountains look purple in the clear atmosphere. In certain protected parts the snow lingers in July, and here and there may be seen perpetual snow and even blue glaciers. The river is fed from the snow peaks farther to the east and is icy cold. It is very swift and navigated only by long canoes dug out of single tree



PAGAN VILLAGE, BELLA COOLA

Deserted, the inhabitants being away at the canneries.

trunks. These canoes are spoon-shaped at each end and are entirely different from the ocean canoes of the coast. They are poled where the river is too swift for paddling. A stranger's best policy is to sit on the bottom of the canoe and leave its management to the Indian owner.

The older Indians of Bella Coola, those who were not away working at the cannery, were preparing fish for winter use and also drying berries. They raised some of the finest strawberries I have ever seen. To prepare for drying they crush these and various native berries, the red and yellow salmon berries and a large sort of raspberry, into an immense cake which they spread on racks made of split cedar covered with the fresh leaves of skunk cabbage or nettle. Here we found an old man carving spoons out of alder wood and an old woman weaving strips of cedar bark into mats. Indians from the interior come to Bella Coola. They look different from those of the coast, are more active and angular. The costumes of both men and women are slightly different from those of the people of the coast. They wear moccasins, which are not used by the Bella Coola or their neighbors, who spend much of their time in the surf and on the beach.

Leaving this valley of the Bella Coola, which is a most beautiful spot, sometimes called the Switzerland of America, we proceeded up the coast to visit the country of the Tsimshian, who live on the Skeena and Nass Rivers and the adjacent coasts. The regular steamer took us to Prince Rupert, the lively western terminus of the Grand Trunk Pacific Railway, where we chartered a launch and visited Old Metlakatla. A missionary was once located here but he had trouble with his superiors in British Columbia and took his followers, about one thousand Tsimshian, to Alaska, where he established the town of New Metlakatla on a grant of land received from the American government. His followers make some of the finest boats constructed on the North Pacific Coast. In the vicinity of the old town we saw a number of shell heaps marking the sites of ancient villages, where archæological explorations would undoubtedly reveal the character of the arts of the ancient people of this area and throw some light on their migrations. Continuing with the launch we went up the Nass River near the boundary between Alaska and Canada, visiting the old eulichon fishing grounds, and then crossed into Alaska to stop at many places before turning back at Skagway.

Our longest stay was made at Wrangel, in the country of the Tlingit Indians, where are large numbers of totem poles, carved grave posts and mortuary columns. From Wrangel we made a most interesting trip up the Stickine and Iskut Rivers. The river is too swift for rowing or paddling canoes, and all former ascents had been made by poling, bushing or lining. After proceeding as far up the Iskut as it was possible

to go, in fact to a place where the current was so swift that with full speed ahead of the engine the boat made no progress against the current, we made camp and completed our studies in this direction. Returning to the mouth of the Iskut much more quickly than we went up, we ascended the Stickine to the Great Glacier, and then came back to Wrangel and went by regular steamer to Haines, and thence to Kluckwan by the military road.

Kluckwan is a village of the Tlingit Indians on the old Dalton trail to the Klondyke. Here we saw the Tlingit women making Chilcat blankets. This blanket, as is well known, is one of the most remarkable kinds of weaving done in North America. It is made from cedar bark and mountain goat wool and decorated with woven designs characteristic of the region. In very ancient times the designs were of a geometric character, similar to those of the Tlingit baskets, but the blankets which are seen to-day bear the animal motives common on the carved wooden boxes of these people.

From Kluckwan I returned to the Museum, while Mr. Taylor continued his color studies by visiting the Haida at Masset on the northern end of Queen Charlotte Island and the Nootka at several villages along the western coast of Vancouver Island, before coming back to New York.

HARLAN I. SMITH.

RESULTS OF AN ART TRIP TO THE NORTHWEST COAST.

MURAL DECORATIONS PLANNED TO SHOW INDIAN INDUSTRIES.

PREVIOUS to the starting of last summer's expedition to British Columbia and Alaska it was decided that there should be two distinct series of pictures in the mural decorations of the North West Indian Hall, and that one series, on the west side of the hall, should be devoted to the industries of the Indians, while the other, occupying the east side, should deal with Indian ceremonials.

The industrial series will have its subjects arranged according to the geographical relations of the seven distinct Indian groups: the Tlingit of



MORTUARY COLUMN, WRANGEL, ALASKA

The bodies are within two covered niches in the shaft

Alaska, Haida of Queen Charlotte Islands, Tsimshian near the Nass and Skeena Rivers, Bella Coola between the Burke and Dean Channels, Kwakiutl on the mainland and northeast end of Vancouver Island, Nootka on the west coast of Vancouver Island, and Salish at the extreme southern extremity of British Columbia.

According to prominent writers the typical industry of each tribe serves as a means of commerce and trade among the neighboring tribes, the conditions of the country naturally influencing its products; for example, when the northern Indian is weaving blankets out of mountain goat wool, the southern Indian may be drying clams for the winter's food. Therefore in the first series of paintings the effort will be made to show not only the industries, but also the connections of these industries with those of other tribes. These pictures will present the scenes where the material was procured, how it was prepared and as far as possible the use of the finished article in trade.

To gather the artistic and scientific data for the first painting of the series, showing the weaving of the Chilcat blanket, I searched through many towns and villages, often in vain, because the weather-beaten and adze-carved boards of the old houses had their original color hidden under white man's paint. In Wrangel, I made many color notes valuable to my work, yet it was not until I reached the Great Glacier on the Stickine River that I caught the spirit of Alaska. Having waited two days for the dense fog to rise, I at last beheld a beautiful glacier partly covered with snow converging toward a small river of ice at the junction of the mountains. The scene partly in sunlight gave me the first inspiration for the Tlingit decoration. I got the remainder of the subject in the Chilcat River section at Kluckwan where two old women, seated in their peculiar fashion on their heels, were creating a blanket, stripping the cedar bark for warp and spinning the wool from the crude wool of the mountain goat.

To obtain data for the second or Haida decoration, I went to Masset, Queen Charlotte Islands, but in all the twelve days spent there, I had but a few hours of sunshine in which to make sketches and so gather in the material I had located. There were days of waiting and watching in the rain. When an opening came in the clouds I had to cover a hasty two miles along the sandy beach to catch on canvas the brilliancy of color displayed — gaining often a severe drenching as an additional reward.

The Queen Charlotte Islands have long been inhabited by the most



CHILCAT BLANKET (UNFINISHED) AND PATTERN BOARD, KLUCKWAN, ALASKA

skillful builders of canoes, enormous dugouts from cedar trees. Although no canoe was being built while I was there, one six fathoms long had been made the previous winter. The Indians were still interested in it and manifested considerable pride in showing their work. Urged on by their pride, they carefully explained details and in many cases splendidly illustrated them, as a result of which I gained dozens of pencil compositions and many local color notes, so that the Haida painting will show graphically the Indians at work carving and steaming the canoe in the midst of characteristic surroundings.

From Prince Rupert, our headquarters in the north, we traveled to



CHINOOK CANOE, NEAR VICTORIA

The Indian is excavating the interior with an adze

Nass River. On our way we were informed that a native artist lived at Georgetown. To learn that a picture painter, not a mere decorator, existed among these serious-minded peoples who are accustomed to make only abstract designs stimulated my interest. Late in the afternoon we moored beside a raft of logs and had to dance our way for many yards over the moving tree trunks to reach the shore. We finally reached the shack of the artist and, watched by a large and curious family, were ushered into his "studio." He exhibited odd bits of broken glass which when held toward the light showed strange drawings in color,

sometimes almost caricatures. Yet they held a certain charm, telling tales of legendary battles or of wonderful ceremonials. In spite of the difficulties in the way of his work the man was a true artist, an eager spirit, in a race where enthusiasm is rare.

At Redcliff on the Nass River there was most charming art material, the mountains high and partly obscured by clouds dwarfing the houses along the shore. It rained almost continuously, however, during our stay, but there were intervals when we ventured from the boat in spite of the rain. Walking along the shore we found it impossible to get close to the houses, the nettles, grown since the previous fishing season in March,



HAIDA CANOE, ALERT BAY

forming a successful barricade. Even on the outskirts we found it uncomfortable to stay long in one place, because the refuse of last season's catch still retained its disagreeable odor. So I was obliged to procure sketches from a distance.

Once a year the tribes congregate at this place as they have done for years. For one month, while the run of eulichon or candle fish is on, the Indian employs all his time catching the small sardine-shaped fish and preparing it for use. Many hundreds of the fish are dried in the sun to serve later as candles. Many more hundreds are put into water with hot stones and allowed to cook until the oil rises and can be skimmed off to serve later as butter. The third picture, that of the Tsimshian,

will show this eulichon industry. Natives hang fish on racks to dry in the sun, women press the sediment left from the cooking through a coarse mesh to secure the remaining oil. The fire silhouettes the figures and makes plain the method of heating the stones. There is a lean-to, an old building used only at this time of the fishing, and always the Nass River with its sand bars flows in swift current beyond the trees.

One of the pleasantest localities we visited was Bella Coola at the head of Burke Channel, the site that furnished material for the fourth painting of the series. Set back between the mountains the Bella Coola valley with its swift river and its lines of delicately colored cotton-wood trees impresses one at once with its beauty. Here we found excellent gardens, ideal homes and broad fields. On either side of the river were Indian communities, one modern and under missionary influence, the other still retaining its old customs.

I learned here the fascinating facts of the bread-making industry. Down in the flats, near the mouth of the river, the families gather during the summer and make bread for themselves and their neighbors. Seated in a rope chair, high up in a hemlock tree, a native scrapes away the inside bark of the tree. Below in the sunlight children hold out a cedar blanket to catch the shreds as they fall. Near them is the large pit in the ground to which they carry the bark for cooking. Hot stones are put over the surface of the pit, and over these stones alternate layers of moist skunk cabbage leaves and the scraped bark. Four days are required for the cooking, at the end of which time the bark is ground into a pulp by means of pestle and stone, and then is left in the sun to dry.

Everywhere during the expedition I studied the commercial transactions of the Indians, but it was not until I reached the Kwakiutl tribe, on the northeast end of Vancouver Island that I found material for the fifth picture. Since the traders have taken away from the Indians all the skins and furs, tribal currency has been limited to blankets, though to a large extent it has given place to the money of the United States and Canada. We find the Kwakiutl Indian still using blankets for exchange in their potlatches, and therefore I have chosen this tribe to illustrate the fact that a basis of finance did exist. It must have been no unusual thing in the past to see ornamented natives unload canoes full of blankets, while groups of waiting "financiers" stood in picturesque arrangement before their houses and totem poles.

When I reached the west coast of Vancouver Island, where I went in

search of data for the sixth painting, the Nootka Indians had returned from fishing and hop-picking. Villages were no longer deserted, and activity showed on all sides. Along the shores canoes with swan-like barbed prows and straight high sterns were being hewn. At Clayoquot I secured the locality, color and facts for a whaling picture,—on the brilliant sandy beach the whalers had returned from a successful hunt, while the inhabitants of the village welcomed a dignified old chief in his ceremonial costume.

Briefly, then, I am trying to show in this series of mural paintings that the trading among the tribes of the northwestern coast was mainly through the products of their own industry. The Tlingit exchanged their Chilcat blankets for Haida canoes. The Haida traded their canoes for the eulichon grease of the Tsimshian. The Bella-Coola who were the bread makers exchanged their bread with neighboring tribes. Thus through all the coast tribes we find distribution of industrial products going on, and to-day the results of this commerce are evident, for in the extreme south one finds the work of the tribe living farthest north, and vice versa.

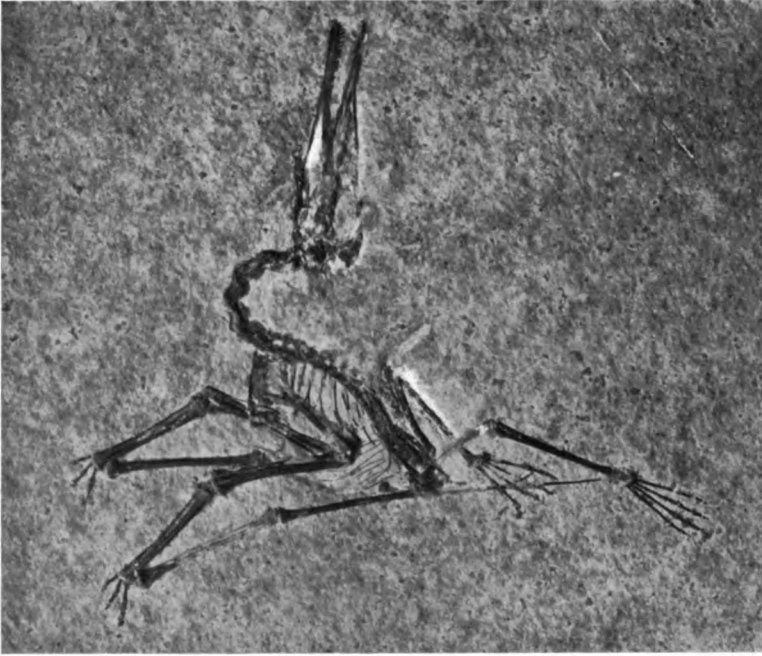
WILL S. TAYLOR.

A COMPLETE PTERODACTYL SKELETON.

THE Museum has recently acquired through exchange with the Munich Palæontological Museum a complete skeleton of a small Pterodactyl of the Jurassic Period. This beautiful little specimen is from the lithographic limestone quarries of Solenhofen in Bavaria and is one of the most perfect specimens of its kind ever found. The Munich Museum has a unique series of these rare fossils from these quarries and parted with this one in exchange for a complete fore and hind limb of *Brontosaurus* which we were able to get together out of the great collections obtained from Bone Cabin Quarry. The Solenhofen specimen is exhibited in a table case in the Dinosaur Hall, together with specimens of the much larger but less perfectly preserved Pterodactyls found in the chalk beds of western Kansas.

The Pterodactyl (from the Greek *πτερόν*, wing, and *δάκτυλος*, finger) was a flying reptile named from the fact that the bones of one finger of

each fore limb were extremely long, carrying a film of skin to enable the animal to fly. The Pterodactyls of Jurassic time were small, none



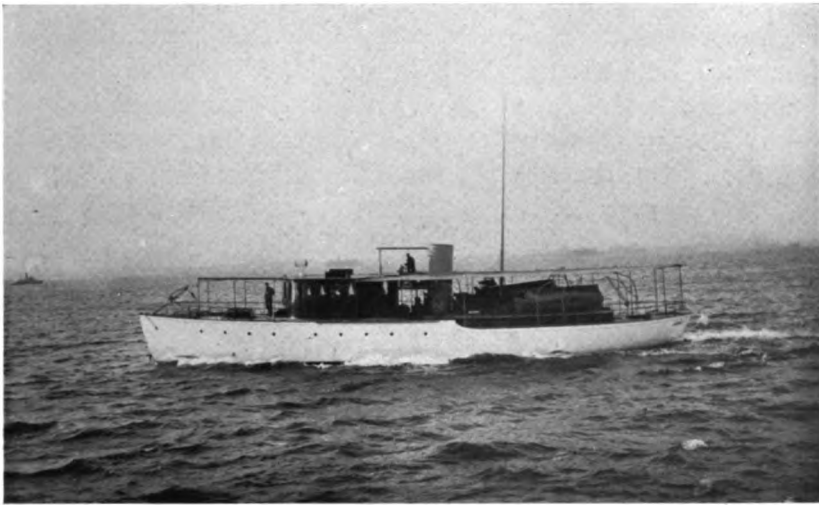
PTERODACTYLUS ELEGANS. SOLENHOFEN. BAVARIA

of them exceeding the modern eagle in size, and their habits were like those of the present day bats.

A COLLECTING EXPEDITION TO THE FLORIDA REEFS.

MESSRS. Alessandro and Ernesto G. Fabbri, members of the Museum who are greatly interested in marine zoölogy, have recently placed their new yacht "Tekla" and their personal services at the disposal of the American Museum. Thanks to their generous offer, it will accordingly be possible during the present winter to obtain valuable collections at various points along the coast of Florida. For this work in collecting, the vessel is admirably adapted: it is suffi-

ciently large (90 feet in length and 17 in beam) to be depended upon in all weather; it is light in draft and when necessary can be taken into water shallower than 4 feet; its gasoline engines take up relatively small space and there thus remains plenty of room for collecting operations; its equipment includes various forms of trawls and dredges and the mechanical appliances which will enable them to be used in all waters to a depth of about 200 fathoms. Particular effort will be made to increase the Museum's collection of fishes from the rich fauna of the



THE FABBRI YACHT "TEKLA"

semitropical waters, and colored drawings of the fishes, moving pictures and, in the case of the larger kinds, plaster casts will be secured. Saw-fish are not uncommon in Florida waters and it is hoped that good specimens of them may be caught. Effort will also be made to obtain a large specimen of the devil-fish, *Manta*, which sometimes attains a spread of 20 feet. Tarpon are readily taken in the waters to be visited and ample material will be brought back for a "habitat group." Mr. John T. Nichols, Assistant in the Department of Ichthyology, left the Museum January 18 to join the "Tekla" at Miami and will spend six weeks in the collecting work.

MUSEUM NEWS NOTES.

THROUGH a bequest of the late Mrs. Georgiana Colgate Stone the Museum has received a portrait of her father, Robert Colgate, by Huntington. Mr. Colgate was one of the founders of the Museum and served for many years on the Board of Trustees.

SINCE our last issue the following persons have been elected to membership in the Museum: Life Members, MESSRS. W. B. BOURN, GEORGE W. BRACKENRIDGE, SAMUEL POMEROY COLT, BAREND VAN GERBIG, GEORGE SCOTT GRAHAM, T. A. GRIFFIN, H. E. HUNTINGTON, O. G. JENNINGS, WM. G. LOW, FRANK E. PEABODY, FREDERICK T. PROCTOR, JOHN A. ROEBLING, ALANSON SKINNER, CHARLES CHAUNCEY STILLMAN, JAMES N. WALLACE and GEORGE PEABODY WETMORE and MMES. W. L. HARKNESS and JAMES R. JESUP; Sustaining Members, MESSRS. R. R. COLGATE and HENRY GOLDMAN; Annual Members, MESSRS. J. FRANCIS A. CLARK, A. S. DWIGHT, A. O. EIMER, JOHN B. FARISH, JOHN L. GOLDEN, IVAN L. C. GOODING, HORACE S. GOULD, MAXIMILIAN GRAB, HENRY GRAVES, JR., DE COURCY L. HARD, HENRY RAWLE, J. O. VON SCHMID, FRANK McMILLAN STANTON, WILLIAM E. STIGER, BENJ. STRONG, JR., ROBERT B. SUCKLEY, GEO. H. SUTTON and THEO. N. VAIL and MMES. FRANK H. RAY and FITCH W. SMITH.

THE Department of Anthropology is fortunate in having received as a gift from Mr. George S. Bowdoin another beautiful example of the feather capes for which the natives of the Hawaiian Islands were once famous. This cape was originally the property of King Kamekameha III and was given by him to Mr. Mackintosh, from whom Mr. Bowdoin obtained it. The cape is described and illustrated in Brigham's book on the Hawaiian Islands.

FREDERICK I. MONSEN gave a special lecture to the Members of the Museum on Thursday evening, January 13, upon the life and manners of the Indians of the Southwest, with stereopticon views and motion pictures selected from his well known collection of photographs made by himself during the past twenty years. For the remainder of the month a large collection of his photographs were on exhibition in the West Assembly Hall.

THROUGH the generosity of Mr. J. Pierpont Morgan the Museum is receiving as fast as issued the magnificent series of volumes on "The North American Indian" now in process of preparation and publication by Mr. Edward S. Curtis, who is so well known for his studies and photographs of the descendants of the aborigines of North America. This work is to consist of twenty quarto volumes of text profusely illustrated with photogravures and accompanied by as many supplementary volumes of folio plates. Thus far five volumes of text with their supplementary volumes of plates have been issued and delivered.

LAST month the modeled mount of the hippopotamus "Caliph" was placed on exhibition in the Department of Mammalogy. Caliph was a familiar sight to the visitors at the menagerie in Central Park, where he was one of the chief attractions for about thirty-five years. He was the largest hippopotamus in captivity on record and probably was as large as any known. He died in January, 1908, of acute indigestion, and his body was presented to the Museum by the Department of Parks.

ON the afternoon of Saturday, January 15, Miss Mary Lois Kissell of the Department of Anthropology began a series of talks in the Academy Room upon "Basketry Weavings of Primitive Peoples" illustrated with examples of the different styles selected from the extensive material in the Museum collections. The second lecture of the series was given January 29. The third and last will be delivered February 5, when the "Technic of Basketry" will be considered and a scheme of classification will be presented by means of which the work of various tribes may be recognized.

THE restaurant upon the third floor of the Museum has been discontinued and a new one opened at the foot of the elevator in a series of rooms which have been fitted up expressly for the purpose and which have been built and decorated after the style of the prehistoric edifices of Mitla, Mexico, giving a vivid idea of the interior of those ancient structures in their prime.

LECTURE ANNOUNCEMENTS.**MEMBERS' COURSE.**

The second course of lectures to Members for the season of 1909-1910 will be given in February and March. Special announcements will be sent out later.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Illustrated.

February 1.— "The Grizzly Bear." By MR. W. H. WRIGHT.

February 8.— "What I Saw in Panama." By MR. CHARLES L. LEWIS.

February 15.— "Hawaii, the Paradise of the Pacific." By MR. A. F. GRIFFITHS.

February 22.— "Martinique and the Mt. Pelée Tragedy." By MR. ROLAND S. DAWSON.

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The last four of a course of eight lectures by PROF. JOHN C. OLSEN on "Pure Foods and their Preparation."

February 5.— "Sweetening Agents."

February 12.— "Condimental Foods: Spices, Cocoa, Chocolate, Flavoring Extracts."

February 19.— "Candies, Aniline Dyes, Coloring Matter."

February 26.— "Jams, Jellies, Canned Vegetables and Fruits."

LEGAL HOLIDAY COURSE.

Fully illustrated. Open free to the public. No tickets required. Doors open at 2:45, lectures begin at 3:15 o'clock.

Washington's Birthday, February 22. EDMUND OTIS HOVEY, "Some American Mining Regions." Particularly those producing Coal, Iron Copper, Gold and Silver.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.
MARY CYNTHIA DICKERSON, *Associate Editor*.

FRANK M. CHAPMAN,
LOUIS P. GRATACAP, } *Advisory Board*.
WILLIAM K. GREGORY, }

Subscription, One Dollar per year. Fifteen Cents per copy.

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MEMORIAL STATUE OF MORRIS K JESUP

By William Couper, Sculptor

The American Museum Journal

VOL. X

MARCH, 1910

No. 3

COMMEMORATION OF THE FOUNDING OF THE MUSEUM

UNVEILING OF THE STATUE OF MORRIS K. JESUP

ON the afternoon of Wednesday, February 9, 1910, a notable assemblage gathered in the Foyer of the American Museum to witness the unveiling of a statue of the late Morris K. Jesup, who for more than a quarter of a century was the president of the institution, and to listen to an address commemorating the founding of the Museum forty-one years ago. Shortly after Mr. Jesup's death in January, 1908, the Trustees and others of his friends, feeling that a suitable memorial of the late President should be installed in the Museum to which he had devoted so much of his life, subscribed to a fund¹ for the purpose of placing in the Foyer of the building a life-size marble statue of Mr. Jesup. Mr. William Couper, the sculptor of the busts of scientists in the Foyer, was engaged to prepare the statue. The artist, from his own long acquaintance with Mr. Jesup, was inspired with his subject and produced a satisfying portrait showing him in his prime.

The exercises were begun with music, and at four o'clock President Osborn and Honorable Joseph H. Choate entered the Foyer leading the procession of Trustees to the temporary platform which had been erected at the south side of the hall, facing the statue. On the platform were representatives of the National, State and City Governments, besides delegates from great universities, scientific societies and other educational institutions in this city and elsewhere, the full list being as follows: J. A. ALLEN, ALBERT S. BICKMORE, JOHN BIGELOW, GEORGE S. BOWDOIN, NATHANIEL L. BRITTON, HERMON C. BUMPUS, NICHOLAS M.

¹ The subscribers to the Jesup Memorial Fund are MESSRS. HENRY F. OSBORN, J. PIERPONT MORGAN, CLEVELAND H. DODGE, CHARLES LANIER, J. HAMPDEN ROBB, CORNELIUS N. BLISS, ALBERT S. BICKMORE, GEORGE S. BOWDOIN, ANDREW CARNEGIE, JOSEPH H. CHOATE, ANSON W. HARD, JAMES J. HILL, FREDERICK E. HYDE, ADRIAN ISELIN, ARTHUR CURTIS JAMES, A. D. JULLIARD, JOHN S. KENNEDY, GUSTAV E. KISSEL, SETH LOW, J. PIERPONT MORGAN, JR., HORACE PORTER, PERCY R. PYNE, ARCHIBALD ROGERS, WILLIAM ROCKEFELLER, JACOB H. SCHIFF, CHARLES STUART SMITH, JOHN T. TERRY, JOHN B. TREVOR.

BUTLER, ANDREW CARNEGIE, JOSEPH H. CHOATE, JOHN M. CLARKE, WILLIAM COUPER, THOS. DE WITT CUYLER, CLEVELAND H. DODGE, DANIEL GIRAUD ELLIOT, JOHN H. FINLEY, WILLIAM J. GAYNOR, MADISON GRANT, ARTHUR T. HADLEY, ANSON W. HARD, SAMUEL V. HOFFMAN, WILLIAM T. HORNADAY, FREDERICK E. HYDE, ARTHUR CURTISS JAMES, A. D. JUILLIARD, JAMES F. KEMP, GUSTAV E. KISSEL, H. M. LEIPZIGER, GOODHUE LIVINGSTON, SETH LOW, FREDERICK A. LUCAS, H. M. MACCRACKEN, WILLIAM H. MAXWELL, JOHN P. MITCHELL, J. PIERPONT MORGAN, HENRY F. OSBORN, WILLIAM A. PRENDERGAST, HENRY S. PRITCHETT, PERCY R. PYNE, J. HAMPDEN ROBB, EDWARD ROBINSON, JACOB H. SCHIFF, HUGH M. SMITH, CHARLES B. STOVER, JAMES W. TOUMEY, CHARLES H. TOWNSEND, JOHN B. TREVOR, BRECK TROWBRIDGE, C. D. WALCOTT, WILLIAM R. WILCOX, CLARK WILLIAMS, EGERTON L. WINTHROP, ROBERT S. WOODWARD.

As soon as the invited guests were seated, the addresses that follow were delivered to a most sympathetic audience that filled the Foyer and overflowed into the Northwest Coast Hall behind the statue. At the close of President Osborn's welcoming remarks, the veil was removed from the marble portrait of Mr. Jesup, and the assembly showed its appreciation of the likeness of their former friend. After the close of the addresses, the members of the Museum and guests present were given an opportunity to visit the newly arranged North Pacific Hall, the Jesup Forestry Hall and the Darwin Synoptic Hall.

ADDRESS OF WELCOME

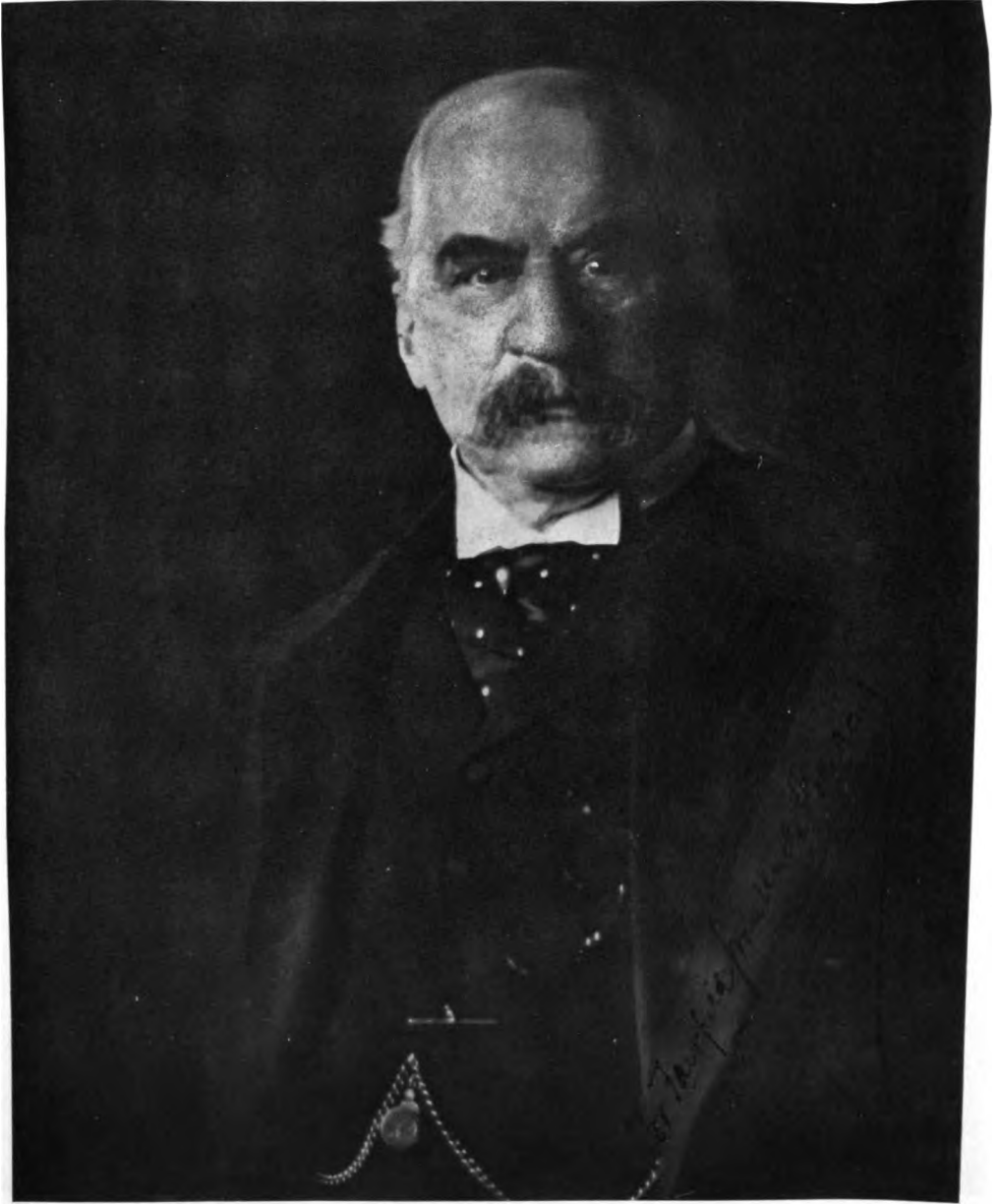
BY HENRY FAIRFIELD OSBORN

PRESIDENT OF THE MUSEUM

Members of the American Museum of Natural History:

We commemorate this afternoon the founding of the Museum in 1869. For their services to our city and country we pay our tribute to the first presidents, John David Wolfe and Robert L. Stuart, and especially to the third president, Morris Ketchum Jesup, distinguished by his long and eventful administration.

As the oldest institution of the kind in the City of New York we welcome



J. PIERPONT MORGAN
A Founder and Trustee

representatives of our twin sister, the Metropolitan Museum of Art, of our younger companions, the Public Library, the Brooklyn Museum, the Zoölogical Park, the Aquarium and the Botanical Garden,—all animated by the same purpose, all under a similar government, and together forming a chain of free educational institutions of which the City may well be proud.

We are honored by the presence of delegates from the President of the United States, from the Governor of this State, from several of the great American universities and from national institutions of scientific research.

We welcome the leading officers of the City government and of the Board of Education. His Honor, the Mayor, the President of the Park Department and the Comptroller are with us as members of our Board. It is significant that these heads of the second great municipality of the world are uniting to play the part of hosts in this celebration, because the City and the Trustees have enjoyed from the first a free and cordial union. From their entire community of purpose there is no reason why they should ever disagree. Through the original application of the Museum for land, this institution is legally under the Department of Parks, but while the relation is amicable and effective, the museums are less a part of public recreation than of the great civic system of education.

A few words may be said as to our future, as to the kind of educational spirit which has been developed under past administrations and will be increasingly developed in the coming years in other branches of science. We believe that we are only on the threshold of the applications of science, or knowledge of the laws of Nature as they bear on human morals, welfare and happiness. If there is one new direction which this Museum shall take, it is in the applications of science to human life. Here people shall have a vision not only of the beauty, the romance, the wonder of Nature, but of man's place in Nature, of laws as inexorable as the moral commands of God handed down by great religious teachers. Over the portals of our new Hall of Public Health we may well place the inscription, "Learn the Natural Commandments of God and Obey Them." If Nature is stern and holds in one hand the penalty for violation of her laws, she is also gentle and beneficent and holds in the other hand the remedy, which it is the duty of science to discover and make known.

What is the part the Museum exhibition halls should play in this education? An ideal museum is a mute school, a speechless university, a voiceless pulpit; its sermons are written in stones, its books in the life of the running books; every specimen, every exhibition, every well-arranged hall speaks for itself. In this sense, in its appeal to the eye, in its journeys for those who cannot travel, the Museum is not the rival but is the ally of all other methods of instruction within its own walls and throughout the great city.

This Museum is a monument of public spirit in New York. We owe the rise of public spirit in this city and country to the war for the Union; that terrible experience brought men and women of all classes together in a closer sympathy, into a new and greater union. Thus Lincoln was our prophet at Gettysburg when he said, "This nation under God shall have a new birth of freedom." As will be fully told by the historian of the day, the inspiration to build a free museum for the people of this city came to us through Albert S. Bickmore. Under his scientific guidance and that of Daniel Giraud Elliot the right direction was taken. Both of these men are happily with us in this hall to-day.

The Founders of 1869, whose names have recently been inscribed on yonder wall, voiced the public spirit of their day. New York was a relatively small and relatively poor city. It was before the era of the great captains of industry, of the single-handed patrons of art, science and education. Nor were there any models on which to draw the lines or to take the scale; there was no British Museum of Natural History, there was no National Museum of the United States. We marvel the more at the audacity of Trustees who conceived a museum so great and who in 1874 approved a general plan larger than that of any building in the world even to the present day, larger than the Escorial of Spain or the National Capitol of Washington.

It crowns this commemoration that four of the originators of the Museum are with us,—two of its scientific advisors, two of its Founders. If I were asked which of the Founders contributed most to administration and development I would say unquestionably Mr. Jesup, Mr. Morgan and Mr. Choate. Of the splendid services of our late President is it not delightful that his colleague for thirty-nine years, Mr. Choate himself, is here to speak?

Our two Founders, *mirabile dictu*, are as young as or younger than they were forty years ago. If youth is measured by energy, by productiveness, by patriotism, these Founders are two of the very youngest men in the City of New York, as each day brings forth fresh, surprising and ever welcome proofs. Who among the so-called younger generation can equal Mr. Morgan, who has quietly and almost unknown to the public sustained the successive administrations of Wolfe, Stuart and Jesup, with his loyalty, his time, his advice, his noble gifts, and who stands behind the present administration with undiminished force and generosity?

Are not our very bones founded in the law? In the early years Mr. Choate rendered incomparable and lasting service, not only to the two museums but also to the City, in laying down our charter relative to that union of public and private responsibility and beneficence which has been the model on which all the other institutions of the kind in this City have been founded. This union has proved by experience to be perfect, for it has



JOSEPH H. CHOATE

A Founder and Trustee

given the city of New York something far superior either to the publicly administered institutions of foreign cities or to the privately owned and privately administered institutions of other great American cities. The essence of this charter and constitution is that from the beginning the city officials as the elective representatives of the people undertake to give the land, the building, the maintenance; the Trustees volunteer to give their best ability and their valuable time to administration, their means and that of others to filling the building with collections.

The agreement has been kept on both sides in the best spirit. To the honor of the City of New York be it said that her rulers have never withheld funds from education, nor have her citizens been lacking in generosity. Owing to this peculiarly American and altogether ideal union of public and private endeavor, we discover that at the end of forty-one years the amount which the people of the city of New York have contributed through their government to this Museum is balanced by an equal amount given by officers, trustees and other friends.

I have therefore great pleasure in introducing as the orator of the day the Honorable Joseph H. Choate, Founder, Trustee and author of the laws of our being.

COMMEMORATION ADDRESS

BY THE HONORABLE JOSEPH H. CHOATE

A FOUNDER AND TRUSTEE OF THE MUSEUM

Mr. President and Ladies and Gentlemen:

Time, like an ever-rolling stream, bears all its sons away, and a lapse of forty years sweeps off a whole generation and more. After their forty years' wandering in the wilderness, when the children of Israel came again to be numbered on the plains of Moab, Caleb and Joshua alone survived of all who had escaped out of the house of bondage in Egypt; and so Mr. Morgan and I alone survive of those who founded this great Museum in 1869. We have accompanied its progress through mazes of doubts and difficulties until it has come at last within sight at least of a land flowing with milk and honey. I am sure that he will heartily join with me in this tribute to our departed associates, that this marvellous growth and development are to be attributed to their fidelity and courage, their public spirit and their unbounded generosity; and when I read their names you will realize how near they come to our hearts and homes, and how much richer and better New York is for their having lived in it:

JOHN DAVID WOLFE

ROBERT COLGATE

BENJAMIN H. FIELD

ROBERT L. STUART

ADRIAN ISELIN

BENJAMIN B. SHERMAN

WILLIAM A. HAINES

THEODORE ROOSEVELT

HOWARD POTTER

WILLIAM T. BLODGETT

MORRIS K. JESUP

D. JACKSON STEWARD

A. G. PHELPS DODGE

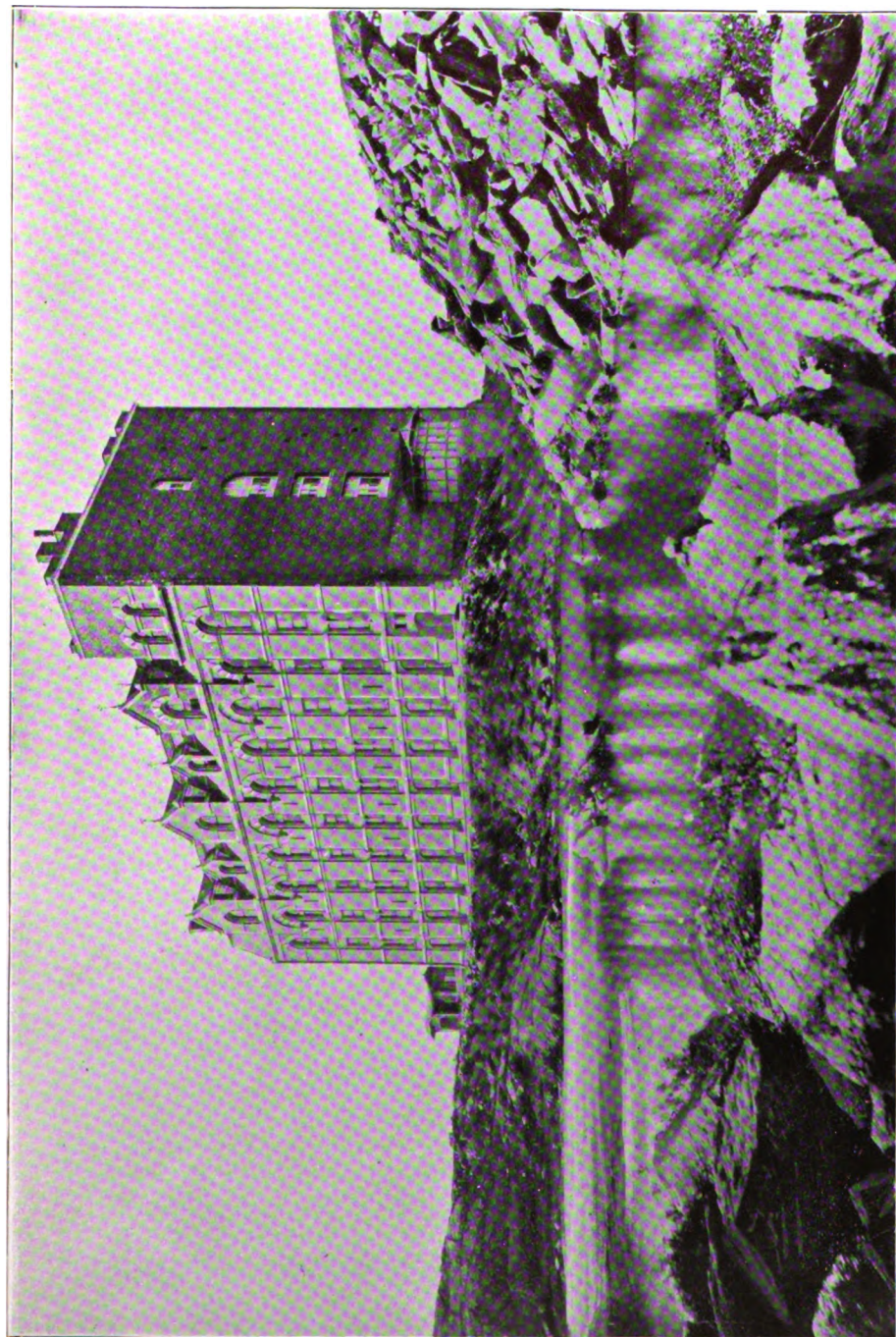
CHARLES A. DANA.

It was to their initiative and far-seeing sagacity that the City and the country owe the beginning of this great educational and scientific institution, and, as you all know, there is nothing so hard as a beginning.

New York was sadly behind her sister cities in this interesting development of knowledge and science. Although she had many learned naturalists, and had made spasmodic efforts for the establishment of a museum in which their valuable collections might be gathered, she had allowed Philadelphia and Boston to be far in advance.

The advent of the great naturalist, Professor Louis Agassiz, at Cambridge, a signal event in the history of Harvard, his boundless enthusiasm for science, and the wonderful manner in which he imparted it to his pupils and hearers, gave an impetus to the study of natural history not only at Harvard, but throughout the country which had never been felt before. The truth is that the acquisition of one truly great man by a university does more for the advancement of learning than whole decades of mediocrity; and Harvard and the country awoke from long slumber to a new life of study and inquiry under the light and leading of this famous scholar and naturalist, and almost all the men who afterwards became famous in natural history flocked about him as pupils and gathered inspiration from his lips. The arrival of Professor Arnold Guyot at Princeton soon afterwards was another great incentive, and the formation and rapid increase of museums at the two universities and in Philadelphia were examples of the practical advance in science as a means of education which New York could not fail to imitate.

There were many strong men here interested in the subject; there were ample resources and many interesting and valuable collections within reach, but there was a total lack of organization, an apparent inability to get together, which paralyzed the growing and general desire for the establishment of a museum of natural history which should be worthy of New York as a great intellectual center. In fact, I am not sure that New York was then a great intellectual center. Its intense energies, stimulated by the triumphant close of our great Civil War, were concentrated in commercial channels, and while they were ready to give generous help to any honorable enterprise, our great merchants and men of rapidly growing wealth had hardly time to think of these higher and better things of the mind. They had to be solicited



MUSEUM BUILDING IN 1881.

urgently and intelligently, before they could realize the importance to the city of such things.

Fortunately there came among us at an opportune time a young and intrepid enthusiast who realized keenly the possibilities of the situation and the vast importance to the city of the creation of such a museum. A pupil of Agassiz's, and a man of boundless energy and indomitable persistence, Prof. A. S. Bickmore, was a capital engine driver to propel the train of the growing sentiment, and to him, I think, more than to any other one man is due the credit of initiating the movement which resulted in our foundation. It is pleasant to think that Professor Bickmore is with us to-day to enjoy the ripe fruits of his early labors, as is also Dr. Daniel G. Elliot, an important and influential friend and scientific adviser in the early days, and now a veteran and most distinguished zoölogist, again connected with our institution as an investigator and writer.

The first thing to be done was to obtain from the State a charter of incorporation for the founders, under which the scattered elements which might make a beginning of such an enterprise could be brought to work together. I well remember our visit to Albany to wait upon the magnates of the Legislature, and ask for such a charter. William M. Tweed was then in absolute command of that body, and I will say to his credit, as one white mark against the terrible array of black ones under which his memory has long since been buried, that he received us most courteously, and seemed to recognize the importance of the project which we had in hand, and the charter was quickly obtained and signed by the Governor.

We asked for no other legislative aid, and dared not expect or hope that the money of the people of a great democratic city could be asked or required to be spent to gratify the taste or promote the scientific pursuits of a few men of wealth and culture; nor did the most ardent lover of natural history dare to dream that within a single lifetime this magnificent group of spacious buildings would be erected at the public expense for the housing of our collections, and maintained by a liberal allowance from the city treasury,—so rapid has been the growth of a wholesome popular sentiment in support of what has proved to be one of our most valuable educational establishments, and a scientific institution which holds a leading place among those of the country and of the world.

The museum was organized under the presidency of John David Wolfe, whose administration of three years, from 1869 to 1872, was the formative period of the infant body which was destined by and by to reach such colossal dimensions as we see to-day. Quarters for the storage and display of its first collections were granted by the city in the second and third stories of the old Arsenal Building near the south end of Central Park, and there

they continued to be kept, until in 1877 the first new building in the center of Manhattan Square was completed.

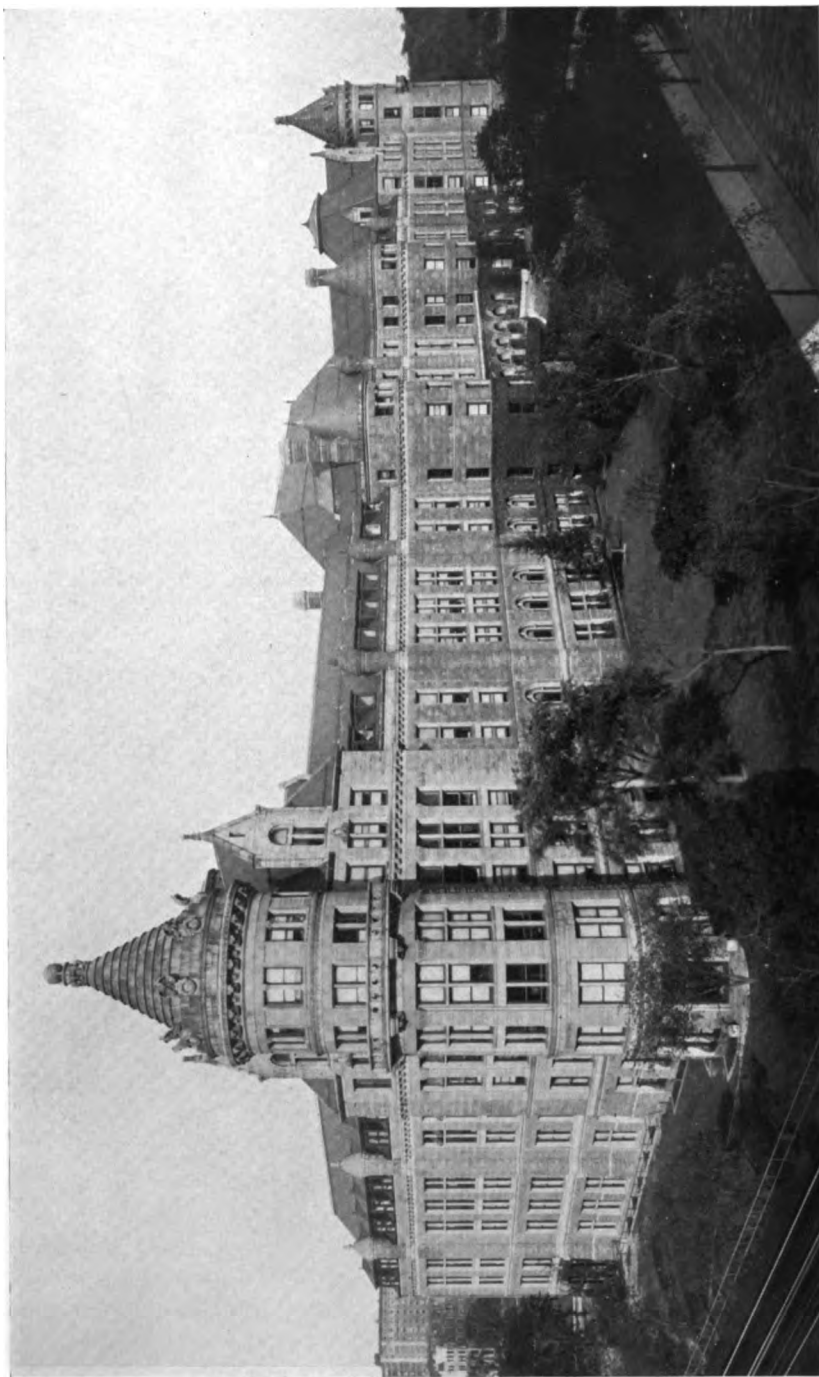
Those earliest days were full of struggle and full of hope, sometimes even against hope itself; and despair sometimes stalked among us as threatening and terrible as if the carnivorous dinosaur had come to life again and showed his terrible teeth; but the fidelity of the president and the never-failing generosity of the more wealthy among the trustees kept the tottering infant alive. Year after year they put their hands in their pockets to make up the inevitable annual deficit, that ever recurring terror and inspiration of all philanthropic institutions. And the boundless enthusiasm of such true lovers of nature and of nature's handiwork as William A. Haines and D. Jackson Steward, constantly breathed new life and spirit into our ambitious purpose to make it a true museum of natural history worthy of the name and of New York.

From the outset we met with the usual fate of all, whether individuals or corporations, who become known as collectors. Miscellaneous collections of every description crowded in upon us much faster than our narrow quarters and limited means could possibly provide for them. Nobody can testify from personal experience more truly than Mr. Morgan of the unhappy predicament of a recognized collector. He does not have to seek collections, but collections seek him from all quarters of the world with voracious appetites and open maw, and would bury even him out of sight, if he had not learned to say No. So it was with our young museum, which would have been bankrupt from the start, if it had not denied itself many tempting offers and learned to say No.

Our first object was to attract public attention and gain public confidence by a well-ordered exhibition of our most attractive collections, while the rest were stored away to await future developments. The trustees and their friends raised forty-four thousand dollars the first year, less than one-tenth of what some of the individual trustees have since given, and five thousand visitors rewarded their efforts as against the million who now throng these spacious halls.

The brief administration of our first president did lay the foundations of the superstructure that was soon to rise. The prestige given to the new enterprise by his high character and his unbounded generosity, followed by that of his daughter, Miss Catherine L. Wolfe, must ever be held in grateful remembrance.

Then came the awful panic of 1873, which threatened to swallow us up as if the earth had opened beneath us. Our hearts melted and our spirits gave way;—but even that calamity was tided over by renewed efforts and redoubled gifts of the richer trustees, by means of which the institution not only held its own, but made steady progress.



MUSEUM BUILDING IN 1908

All the while the trustees and their friends had been besieging the legislature to come to their aid, as every day made it more and more obvious that it was quite impossible to build up by private means alone a great museum which should be worthy to compete with the great museums of Europe, which were supported almost wholly by public monies. To show how modest our aspirations then were, a great petition signed by forty thousand citizens was presented to the Legislature, asking that a single building should be erected at the expense of the city for the joint occupation of the museum of natural history and the museum of art, which at the same time was struggling into being and leading a sickly and precarious existence in private quarters, and sustained largely by the same generous donors.

It was at this period of promising progress and of great struggles under heavy burdens that the ten years' administration of our second president, that generous and public spirited merchant prince, Robert L. Stuart, began, during which the Museum, fostered by public aid and private munificence, grew into a valued and well-recognized educational establishment.

This epoch of steady progress was ushered in by the allotment by the Legislature of the Deer Park on the east side of Central Park for the use of the Museum of Art, and of Manhattan Square, then a remote and almost inaccessible waste land, for the Museum of Natural History, and the appropriation of adequate sums for the erection of a suitable building for each on those respective localities, a most auspicious inauguration of a public policy which provided for the possible growth of each institution in the indefinite future (Manhattan Square alone consisting of eighteen acres) a policy which has already resulted in the expenditure of nearly five millions of dollars by the city under legislative authority in the erection of these magnificent buildings for the housing of our collections, upon which private beneficence has expended an equal amount. And the same may be said of the Museum of Art.

On the second of June, 1874, the corner stone of our first building, designed by Calvert Vaux, as one section of a stupendous plan to cover a large portion — nearly the whole — of the entire square, was laid with imposing ceremonies in the presence of the President of the United States, accompanied by members of his cabinet, the Governor of the State and the Mayor of the City. On the twenty-second of December, 1877, the building was opened with similar ceremonies in the presence of the same august personages. Professor Marsh and President Eliot made admirable addresses, the latter concluding his impressive exhortation to courage and progress by quoting the last words of Moses before he went up on the top of Pisgah to see the promised land which he was not to enter, "The Eternal God is thy refuge, and underneath are the everlasting arms."

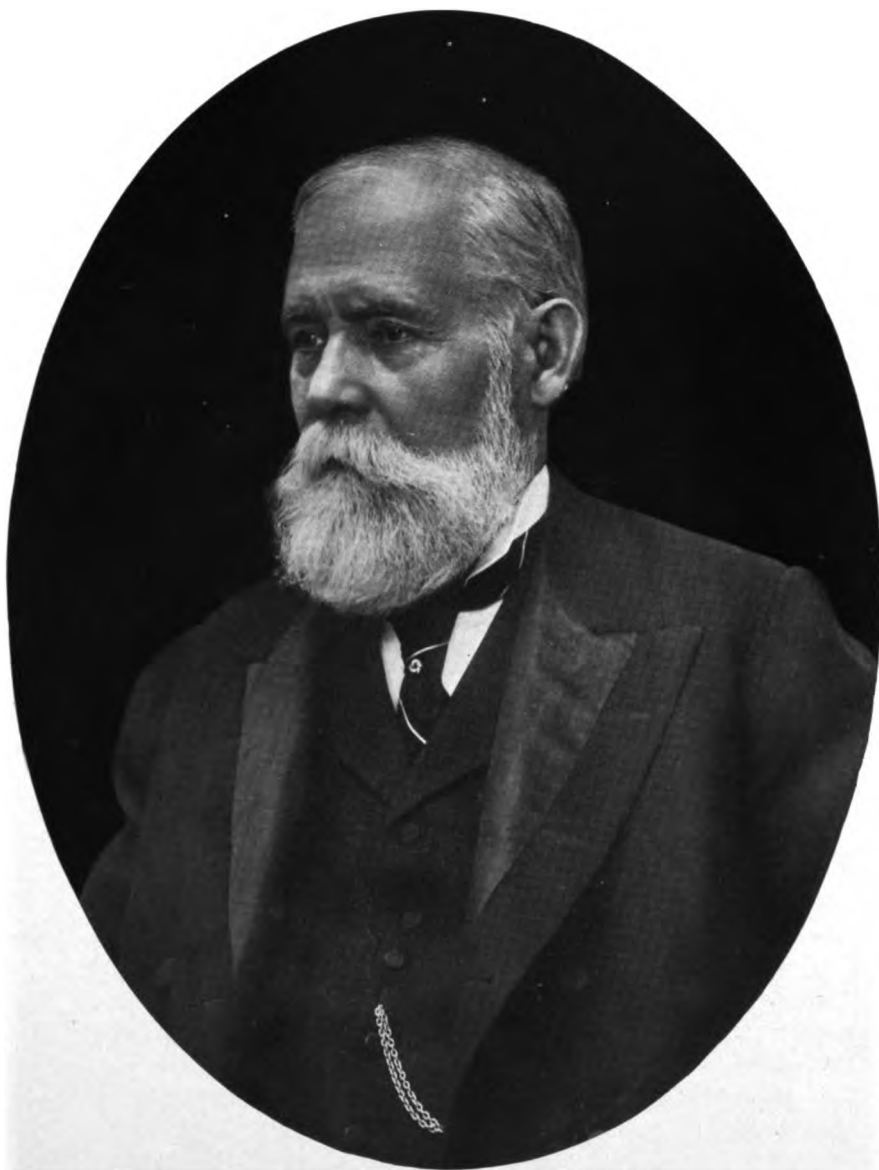
Meanwhile a contract was entered into between the city and the trustees which has subsisted without change for more than thirty-two years, and upon which the contracts of the city with other great institutions like the Museum of Art and the Zoölogical Society have been closely modeled. This contract embodies a mutually generous policy which secures equal advantage to the Museum and the public. It practically provides for a permanent occupation by the Museum of all the buildings erected or to be erected in Manhattan Square, and for a free exhibition to the public of all our collections, under regulations to be mutually agreed upon. The Museum is to continue at all times the absolute and exclusive owner of the collections, and the city the absolute and exclusive owner of the buildings. Under this arrangement the delightful and mutually beneficial relations between the Museum and the people which it inaugurated have steadily grown more close and cordial, to the immense advantage of both.

The administration of Mr. Stuart was one of enormous interest and progress. The Museum was constantly acquiring new and great collections of recognized scientific as well as popular value. A scheme of lectures to public school teachers was instituted under Professor Bickmore, and the Museum began to attract the attention of scientific bodies by the number and variety of its valuable collections. Mr. Stuart's name will be perpetuated as one of our most important benefactors.

I have thus traced the beginnings, but yet only the beginnings, of that truly beneficent institution whose fortieth anniversary we have met to-day to celebrate by the unveiling of this most lifelike statue of the one man who, more than any other — I might almost say, more than all others, for he truly inspired and led all the rest to work in coöperation with him,— has transformed the curiosity shop of miscellaneous and unrelated exhibits which was transferred hither from the old Arsenal in 1877, into this great educational and scientific establishment, this national, this truly American museum of natural history, which is the boast of New York and the admiration of the nation, and may I not say, of the world to-day? If you seek for the monument of Morris K. Jesup, you have not far to go. You have only to wander, with eyes and mind wide open, through these splendid halls, so nobly constructed and fitly equipped, and filled with these collections of wonder and of beauty, among which day unto day uttereth speech, and night unto night showeth knowledge of the works of nature, which are truly the works of God.

I shall attempt no idle words of eulogy of Mr. Jesup, but speak of him only in connection with his work as here accomplished, the crowning glory of a long and honorable life.

To the average observer, the casual layman, untrained by scientific



ALBERT S. BICKMORE
An Originator and Trustee

study, the first impression upon entering the Museum is of its immense utility as a place of popular entertainment, recreation and instruction,—recreation of the most innocent and ennobling kind, for who ever heard of an immoral naturalist, and how could the most casual study of any single thing on exhibition here fail to exalt and elevate the mind and heart? That splendid lecture room, filled to overflowing day after day and night after night with eager teachers and students listening keenly with delight and laying fast hold of instruction, not to let her go;—as the layman enters this vestibule, those wonderful visitors from other worlds, so mysterious and so impressive, excite his imagination and amazement;—as he rises from hall to hall and from floor to floor, does he desire to know the history of his own race, from the days when Adam delved and Eve span up to that considerable civilization which had developed here before Columbus came, every step in the advance from the crudest flint instrument is spread out before him;—would he see something of primitive animal life as recorded in the fossils of many succeeding ages, they are here;—does he incline to study the rocks and minerals and know how and where the most precious stones are found, there is the marvellous Morgan collection of gems, so rich in variety and beauty that the cases containing them are surrounded by hundreds day by day;—is he curious to know how trees grow, there is the splendid Jesup collection of woods from all parts of America;—do the beauties and mysteries of insect life attract him, he is lost in the mazes of entomology;—is he a lover of birds, there they are in their native habitats, all true to life;—would he know what mighty animals roamed the earth before Adam, let him gaze, awe-struck, on the brontosaurus, the mastodon and the dinosaurs in both kinds, and observe how Professor Osborn has learned to put hooks in the jaws of leviathans;—and would he see how woman in all ages has suffered for man, let him visit the copper woman, resting from her labors, immortalized on earth; but his wonder grows as he gazes at her. Will she, who was once all flesh and blood, but long since transmuted into pure copper,—will she wake with the rest of us when the last trump sounds, or has she joined the mineral kingdom forever?

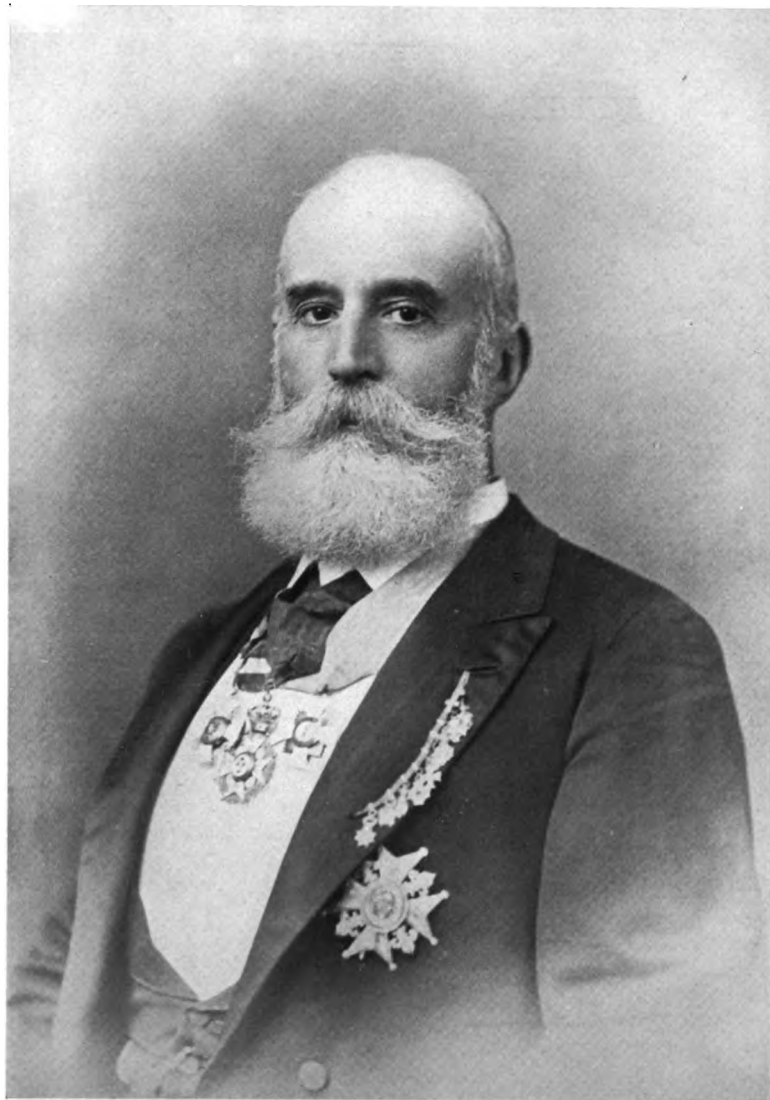
The amusement of the people, however, was only an incident in Mr. Jesup's lofty conception of the true mission of the Museum. He aimed at something far higher and nobler. His lofty purpose was to enlarge and extend the work which had been so well begun, to keep pace with the marvellous growth of the city, and develop the Museum not only into a great educational institution, imparting life and light to the people, but also, which in his mind was the chief object, to make it the home of true science, which should be the center of the scientific activities of the nation, so far as natural history was concerned,—and in all three of these objects his success was most remarkable.

Coming to the presidency in the very prime of manhood, with ample fortune achieved, and the rich experience of a great business life behind him, he bestowed upon the Museum not only generous gifts, constantly repeated, but what was far better, he gave it the best twenty-five years of his life, and all the rich powers of his generous and large-hearted nature. Stimulated by his enthusiasm and his example, the trustees and friends of the institution rallied to its support, and so rapidly did its collections grow, that the Legislature and the City, recognizing its rapidly growing needs, added every four years a new section, a new and noble building to the original edifice, so as to complete already about two fifths of Vaux's original plan, which in 1869 the trustees had had the far-sighted audacity to adopt and approve. I do not hesitate to say that the money spent by the city in the development of this Museum and the Museum of Art is the best investment of public monies ever made by it, whether we consider the direct benefit to the people, or the prestige and character attained by the city as the great metropolitan center of knowledge and culture.

The appetite of the people for what they could learn here grew by what it fed on. The establishment of the Department of Public Instruction, and the erection of a new and complete lecture hall, afforded facilities for education which were largely availed of and widely appreciated. The daily attendance rapidly multiplied, and the people showed their growing love of what they justly regarded as their own free pleasure ground.

Mr. Jesup's generous nature broadened rapidly and constantly with the growth of the work which had come to his hands, not only as to the scope of its objects, but as to the spirit in which it should be administered. This was never better illustrated than in the matter of Sunday opening. At first, and for many years, with the large majority of the trustees, he was utterly opposed to it from early training and prejudice, but as the demand grew, the subject was more carefully considered, and he and those who thought with him yielded, having become satisfied that to look through nature up to nature's God was the best way of spending a portion of the Sabbath, and both he and William E. Dodge, who sympathized with him, and who was one of our most valuable and generous trustees, assured me afterwards that this was the best step forward that the Museum had ever taken.

Mr. Jesup's extraordinary enthusiasm for science and his sympathetic admiration for scientific men, though having little knowledge of science himself, was the most striking feature of his career as President, and wholly unexpected, because he had given up his life before to business and affairs. As he said himself in the report of the trustees for 1886, "It is a difficult task to estimate the money value of what belongs to science and scientific institutions. To their value must be added their ameliorating power, their



DANIEL GIRAUD ELLIOT

educational force, and the scope they afford the higher faculties of man to apprehend the wonderful phenomena of nature, and to master and utilize her great forces." "The highest results of character and life offer something which cannot be weighed in the balances of the merchant, be he ever so wise in his generation." In this view he directed with exhaustless energy and rare intelligence the resources and progress of the Museum.

The establishment of the Department of Woods and Forestry, and his wonderful collection of the woods of America under the direction of Professor Sargent;—the creation of a great Library of Natural History;—alliances with Columbia University and the Board of Education;—the scientific arrangement of the collections in proper departments with a skilled scientific curator at the head of each;—the publications of the Museum, growing more and more valuable to science as the years progress;—the sending out of exploring expeditions to all parts of the world in quest of scientific knowledge and specimens, some of the most prominent of which were at his own expense;—the interchange of specimens and the establishment of mutual and cordial relations with other scientific societies, all testify to this lofty ambition of his to promote here the highest possible objects which he happily lived to see realized. I must not omit his generous and unfailing support of Peary in his repeated and undaunted efforts to reach the North Pole. We had hoped to have that famous discoverer here to-day, but I have the great privilege to read this letter from him, just received.

NEW YORK, February 9, 1910.

Dear Sir:

It is with the deepest regret that I am obliged to say that an engagement in another city, which cannot be postponed, will make it impossible for me to be present this afternoon on the occasion of the unveiling of the statue of my friend, Morris K. Jesup.

His breadth of mind and character is perhaps in no way indicated more clearly than by the wide range of his interests, as shown by the two projects in which his heart was most deeply centered — the future of the American Museum of Natural History and the discovery of the North Pole.

The fact that such a big, broad, practical mind as his should take up with such deep and steadfast interest the question of North Pole efforts, proved to me conclusively that my own conviction of the value of those efforts was correct.

To Morris K. Jesup more than to any other one man is due the fact that the North Pole is to-day a trophy of this country.

His faith and support carried me past many a dead center of discouragement amounting almost to despair.

Friend of unswerving faith, advisor of keen, long-headed ability, backer of princely generosity, he was first in my thoughts when I reached that goal of the centuries, first in my thoughts on my return, and my ever present regret is and has been that he could not have stayed with us a little longer to see the realization of his faith.

Faithfully,

(Signed) R. E. PEARY, U. S. N.

President HENRY FAIRFIELD OSBORN.

By all these means the Museum did become, in Mr. Jesup's life time, a veritable Mecca for scientific men and societies from all parts of the country, and foreign scientists of distinction were its frequent visitors. He labored in season and out of season with the authorities of the City and State to promote the interests of the Museum, and by the princely bequest of a million dollars doubled our endowment fund, which he had labored strenuously and already contributed generously to create. The debt of gratitude which the Museum and the City owe to him can only be repaid by continuing his work, and carrying it as near to perfection as the ever-growing domain and horizon of science can permit it to go.

We should be false to him and to our own trust if we allowed the work of the Museum to stop where he left it, advanced though that point was. Its relations with the city are fixed and permanent. It has grown with the growth of the city in the past, and it must continue to do so. Judged by its marvelous present development, New York is destined soon to become the greatest of the cities of the world. Shall it be content with riches and luxury and material strength, or shall it lead, as it ought to lead, its sister cities in higher things, in knowledge and culture, in art and science? We and our successors can give it that lead, if we will, by promoting with all our might the higher objects of such institutions as this and the Museum of Art, and the universities, so as to make the higher education and training of men and women the leading feature of our civic life.

I deem it a great privilege in behalf of the donors to present to the Museum this fine statue of our beloved and honored President, Morris Ketchum Jesup, and am glad that his Honor the Mayor, who by virtue of his office is one of our trustees, will accept it on the part of the Board.

RESPONSE

BY THE HONORABLE WILLIAM J. GAYNOR

MAYOR OF THE CITY OF NEW YORK

Gentlemen:

No one can witness this occasion, or go through this great Museum, without a feeling of pride in this great city. It and its citizens are constantly doing something for the moral and intellectual elevation of the community. The good thus done is incalculable. The result is that this is the most intelligent, decent and moral large city in the world. But while many

noble men and women like Mr. Jesup have been doing this work, others in recent years, aided and abetted by a very few newspapers, of which we are all ashamed, have been decrying the city and its people, and spreading throughout the world that they are sunk in vice and sin. I would that they were here this day. They might imbibe some sense of shame. They have also spread throughout the world the wholly false notion that this city is in a doubtful financial condition. The result is that recently our 4 per cent. city bonds sold down to 100.14, while the similar bonds of the comparatively small city of Baltimore sold at the same time for 105.17. It is time that the decent men of this city put an end to this. There is no safer security in the world than the bonds of this city, and yet they have been cried down, until they sell for less than railroad securities which are safe, but not absolutely safe, like the city bonds. The funded debt of this city can never exceed ten per cent. of the assessed value of the real estate on its tax books. It is, for that reason alone, of the same security as a mortgage on real estate, for only one-tenth of its value. But in addition to that, it has back of it the taxing power of the state forever. I hope that those who love this city and work to uplift it and are so worthily represented on this occasion will make their voices heard against all this detraction, and reassert the moral and financial soundness and superiority of this city.

ANNUAL MEETING OF THE TRUSTEES

AT the Annual meeting of the Board of Trustees, which was held on Monday, February 14, 1910, the following elections to the Board were announced:

In the Class of 1912, Mr. T. DeWitt Cuyler, to take the place of Mr. Cornelius C. Cuyler, deceased, and in the Class of 1914, the Hon. George W. Wickersham, in addition to Messrs. J. Pierpont Morgan, Joseph H. Choate, Henry F. Osborn and James Douglas, who were reelected from the Class of 1910.

The following changes in the Scientific Staff were announced: In the Department of Geology and Invertebrate Palæontology, Prof. R. P. Whitfield, the Curator of the department since 1877, has been made Curator Emeritus, and Dr. E. O. Hovey has been promoted to the Curatorship; in the Department of Anthropology, Dr. Pliny E. Goddard has been appointed Associate Curator, Mr. Harlan I. Smith has been advanced to Associate Curatorship, Dr. Herbert J. Spinden has been

appointed Assistant Curator and Mr. Alanson Skinner has been added to the list as Assistant; a new Department of Public Health has been established with Prof. C. E. A. Winslow as Curator; a new Department of Woods and Forestry has been established, with Miss Mary C. Dickerson in charge.

Announcement was made at the meeting that Mrs. Morris K. Jesup had added to her previous benefactions the gift of a large collection of ethnological material from the Philippine Islands, valued at \$6000, and the contribution of \$10,958.33, being the sum required for the third payment on the Cape York (Peary) meteorites, which are a gift from her to the Museum.

Announcement was likewise made of a gift by Mrs. John B. Trevor of \$5000 to the Permanent Endowment Fund which is to be added to the John B. Trevor Fund; of gifts from Mr. Archer M. Huntington of \$5000 for anthropological work in the Southwest and \$5,000 toward a fund for Antarctic exploration; and of the gift from Mr. Arthur Curtiss James of \$5000 toward the Antarctic exploration fund.

MUSEUM NEWS NOTES.

SINCE our last issue the following persons have been elected to membership in the Museum: Patrons, MR. THOS. DE WITT CUYLER AND HON. GEORGE W. WICKERSHAM; Life Members, Messrs. A. RADCLYFFE DUGMORE, THEODORE R. HOYT, FREDERIC H. KENNARD, ALFRED H. MULLIKEN, NATHANIEL CUSHING NASH, DE LANCEY NICOLL, R. A. C. SMITH and ALFRED RUTGERS WHITNEY, JR.; Sustaining Member, Mr. J. B. GREENHUT; Annual Members, Messrs. F. B. ADAMS, W. L. ANDREWS, MISHA E. APPELBAUM, ALEXANDER ARBIB, G. W. E. ATKINS, WM. CHILDS, JR., SAMUEL W. EHRLICH, WM. H. FARRINGTON, L. P. FEUSTMAN, HAROLD H. FRIES, EDWIN GOULD, JR., JOHN ARTHUR GREENE, LOUIS M. GREER, EDWARD GRIFFITH, E. MORGAN GRINNELL, O. J. GUDE, HENRY WILLIAM GUERNSEY, R. A. GUSHEE, A. FILLMORE HYDE and JAMES NESMITH and Misses M. TABER and FLORENCE WATERBURY.

DR. HERMON C. BUMPUS, Director of the Museum, sailed from New York on February 17 on a tour to Yucatan, Mexico and the southwestern States. In Yucatan, Dr. Bumpus will visit the famous Mayan ruins of

Chichen-Itza, and in Mexico he will spend some time at the great Aztec ruins at Mitla near Oaxaca. These visits are for the purpose of making field studies that will be used in reproducing certain of the prehistoric ruins of North America for structural use in the new hall of Mexican archæology which is planned for the next addition to the Museum building. On his way back from Mexico, Dr. Bumpus will visit the copper mining regions of New Mexico and Arizona, making studies for use in connection with proposed groups illustrating some famous American copper mines and will make a tour of inspection among the anthropological field parties which the Museum has in the Southwest.

MR. FRANK M. CHAPMAN, Curator of Ornithology, sailed for Mexico on February 17, to make studies and collect specimens and accessories for one of the new series of Habitat Bird Groups. This Mexican group is designed to show the characteristic birds of the American tropics,—parrots, toucans, trogons, motmots and others. The locality represented by the foreground will be in the “tierra caliente,” or tropical portions of the State of Vera Cruz, while the painted background will lead one to the snow crown of Mt. Orizaba, since to explain the significance of perpetual summer and perpetual snow in the same scene will be one of the objects of the group. Mr. Chapman is accompanied by Mr. Louis Agassiz Fuertes, the well-known artist, who will make studies for the background as well as for the birds of the group.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The second course of illustrated lectures for the season 1909–1910 to Members of the Museum and persons holding complimentary tickets given them by Members will be given in March.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

March 3.—DR. PERCIVAL LOWELL, “The New Canals of Mars.”

These are not simply new canals to us but new on Mars. From the long continued records at the Lowell Observatory, Dr. Lowell, the Director, proves that these canals have originated on Mars within the last few months.

March 10.—PROF. WILLIS L. MOORE, “The Story of the Weather.”

Professor Moore is the Chief of the United States Weather Bureau, and in his lecture will give an account of the work of his Department, a subject of wide-spread interest at the present time.

March 17.—PROF. HENRY E. CRAMPTON, "The Living and Older Volcanoes in the South Pacific."

During the past year Dr. Crampton, curator of Invertebrate Zoölogy, spent several months among the Islands of the South Pacific, visited the active volcanoes of Kilauea in the Hawaiian Islands and Savaii in the Samoan Islands, and obtained an interesting series of photographs of these volcanoes in action.

March 24.—MR. GIFFORD PINCHOT, "The Conservation Movement."

Mr. Pinchot is the President of the National Conservation Association and is perhaps responsible more than any other one individual for the present efforts to conserve the natural resources of our country.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday and Saturday evenings at 8:15 o'clock. Doors open at 7:30.

All lectures illustrated with stereopticon views.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;

Second Mondays, Section of Biology;

Third Mondays, Section of Astronomy, Physics and Chemistry;

Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;

The New York Entomological Society;

The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;

The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.





HONORABLE JOSEPH H. CHOATE, A FOUNDER AND TRUSTEE

From life-size portrait by PRINCESS LWOFF-PARLAGHY

The American Museum Journal

Vol. X

APRIL, 1910

No. 4

PORTRAIT OF THE HONORABLE JOSEPH H. CHOATE

A FOUNDER AND TRUSTEE

AMONG the founders of the Museum, one who stands out prominently for long-continued and valuable services to the institution is the Honorable Joseph H. Choate. Only on rare occasions, however, can Mr. Choate be found in person within its walls, but from now on visitors may see his genial face and feel the energy of his presence in a life-size portrait painted with unusual power. The portrait is the work of Princess Lwoff-Parlaghy and is presented by her to the Museum through President Osborn.

The artist has painted more royal and princely personages than any other living painter, and although still young, counts some two hundred portraits of well-known persons as her life work. From the time of her childhood at Hajdú-Dorog, Hungary, she has shown marked talent in portraiture and has a strength and ruggedness of style reminding one of Rembrandt and Franz Hals. She studied at Budapest and Munich, having the unique distinction, for a woman, of working under the great von Lenbach, then went to Italy for study of the Italian school. It was while here that she made her first great success in a portrait of Kossuth, the Hungarian patriot, who was living in exile at Turin. The portrait now hangs in the Museum at Budapest. Afterwards she worked in Holland, devoting much time to the Dutch masters.

The most celebrated paintings by the Princess are probably a portrait of Kaiser Wilhelm II and one of von Moltke, the former hanging in the imperial castle at Berlin, the latter in the building of the General Staff of the same city. Others of her pictures are to be found in the museums of Dresden, Leipzig, Heidelberg, Hannover and Vienna. She has received more and higher decorations in the sphere of art than any other woman in the world. Among these medals and decorations may be mentioned the great gold state medal of Germany (the Princess is the only woman in the world who has received this honor), "Hors Concours" and life member of the jury of Berlin, the great gold medal

for art and science on the ribbon of the order of the crown of Wuerttemberg, the order of the Holy Sava of Servia, the large medal for art and science and the great gold medal from His Holiness Pope Leo XIII, the academic laurels and election as "Officier de l'Académie" of France, the gold state medal of Prussia, the gold medal of the Paris Salon and the great Chicago medal of the World's Columbian Exposition.

The present portrait represents Mr. Choate clad in the bright red gown of Oxford University, from which he received the degree of D. C. L. in 1902. He is seated in an arm chair, his right hand on his knee clasping the collegiate cap, but so well has the artist caught the spirit of the man that he seems about to rise in greeting and to be on the point of giving utterance to some of those happy phrases which make him an orator of international reputation. The artist has unusual strength in the individualization of greatness and in this, her latest work, she has been particularly successful in giving expression to the sterling qualities which so endear Mr. Choate to his friends.

LENDERS INDIAN COLLECTION

THE Lenders collection, valued at \$30,000, which has recently been purchased by Mr. J. Pierpont Morgan for the Museum has now been temporarily installed in the South Pacific Hall on the fourth floor. The collection, brought together through many years of travel by Mr. E. W. Lenders, a noted artist of Philadelphia, is rich in material from the Plains Indians, although there are some specimens from the Eastern Woodlands, the North Pacific Coast and the Southwest. The tribes are, in order of the importance of their representation, the Sioux, Cheyenne, Arapaho, Blackfoot, Crow, Nez Percé, Plains Cree, Assiniboine, Apache, Comanche, Kiowa and Shoshone.

A highly interesting part of the material is a series of Sioux costumes. Seven scalp shirts attract immediate attention. The best of them is an old one made of antelope skin decorated with beautiful porcupine-quill work and colored with native dyes. Several women's costumes are noteworthy, and among them are two dresses of more than usual interest. One is very old and is of skin ornamented with elk teeth. It is the second specimen of the kind to come into the possession of the Museum. The

other is a more modern dress made of blanketing, but it is decorated with imitation elk teeth cut by the Indians from elk antler. These are so well carved and polished as to deceive any but the most experienced observer.

In the material obtained from the Blackfoot there is a group of specimens from a noted medicine man known as "Pretty Antelope." This comprises his costume consisting of an ermine headdress with beaded horns, shirt and leggings beautifully beaded and decorated with dozens of ermine skins in the form of a fringe, with belt and moccasins to match, and his tomahawk, lance, tobacco bag, scalp ornaments, rattles, talisman, medicine pipe and all the paraphernalia of a shaman. This makes one of the most complete personal outfits in the Museum.

Among the costumes from other tribes there are several unusual or particularly significant examples. A splendid Comanche suit includes leggings which have enormous flaps trailing on the ground more than twenty inches. Several pairs of Apache leggings have moccasins attached which show the big toe protector. A Pawnee shirt is decorated with porcupine quills in a manner suggesting a more northerly region. The Apache, Comanche and Kiowa objects show the peculiar ideas of dress of these people, such as lack of beads and presence of painted designs in the ornamentation. A magnificent eagle-feather war bonnet has a double trailer which dragged on the ground after the wearer. A very rare wig made of buffalo hair with long tips of horse hair of a lighter color has the hair strands ornamented and held together by daubs of red paint at intervals of about an inch.

The art work of the Indians is represented by moccasins, vests, charms, awl cases, bags, saddle blankets and game bags, carriers and parts of horse accoutrements and pipe and fire bags decorated in beads and quills. Smokers will be interested in the collection of catlinite pipes. The stone for the bowls of these pipes was obtained at the famous quarry at Pipestone, Minnesota, which is still in the possession of the Indians, who have kept, with the sanction of the Government, the exclusive right of quarrying this peculiar stone. The pipes in the collection, many of them with decorated stems and bowls, represent the handiwork of practically all the larger Plains tribes and some of those of the Eastern Woodlands.

The Indians of the Southwest have contributed to the collection many curiously wrought objects in silver and other metals, such as

bracelets, wrist protectors, belts and necklaces. Particularly remarkable is a necklace of turquoise and silver beads with a pendant of hammered silver. Seven medals dating from 1829 to 1857 represent tokens given to noted Indian chiefs by Presidents Andrew Jackson, John Tyler, Zachary Taylor, Millard Fillmore, Franklin Pierce and James Buchanan. The custom of giving medals bearing an embossed portrait of the President is still in vogue, but it is almost impossible to obtain them from the Indians who have been honored.

Basketry and pottery are not as well represented, since Mr. Lenders, from the character of his work as an artist, took more interest in collecting costumes and the utensils and weapons of the material culture of the tribes. There are, however, a few splendid old baskets including two of the feathered Pomo variety and three of the pitch-covered water baskets of the Southwest. There are some interesting specimens of pottery from the Pueblo region and buffalo and mountain sheep horn spoons from the Plains. The most valuable spoon, however, does not come from the Plains region but is a large one of beautiful translucent horn from the Haida of the Northwest Coast of America.

In regard to weapons and war pieces, there are quivers and bows and arrows, buffalo lances, tomahawks and stone clubs of various sizes and shapes. Two clubs, the stone heads of which are covered with beads, are known as "coup sticks." In former times, the most notable achievement of an Indian was the taking of a scalp, but with the introduction of rifles the killing of a man became so easy and there were usually so many scalps taken after a battle that this trophy began to lose its importance. The Indians considered it a much braver act to touch the body of a fallen foe with a coup stick under fire of the enemy. There are two buffalo hide shields, one of which is worthy of special mention. It is from the Osage tribe and has a buckskin cover with symbolical paintings. From this cover there formerly depended eagle feathers, the shafts of which were decorated with dyed hair woven in various patterns. A bullet hole through cover and shield and what seem to be blotches of blood suggest the fate of its original owner.

Besides all these, the collection includes series of baby carriers, Indian dolls, wampum peace belts, Navajo blankets, necklaces of deer's hoofs and bears' claws, ghost dance clubs, scalp dance wands and medicine otters.

A special feature of the collection is the extensive series of articles

of painted buffalo hide, Mr. Lenders having made a special study of the buffalo. Among the objects, besides the two shields mentioned, is a small Shoshone medicine tipi painted with realistic designs. There are also several saddle bags, a Winnebago drum with a painting of the Thunder Bird on one side, together with many rattles and other articles.

The objects from the Indians of the Southern Plains were much needed in the Museum collections, which still are weak in material from the Southern Plains region and the Southeast in general, though rich in that from the Northern Plains.

THE MUSEUM RESTAURANT

REPRODUCTION OF TEMPLE RUINS AT MITLA, MEXICO

THE Museum has a new restaurant — a very novel one. Taking the elevator to the east basement, we find ourselves within the three rooms that comprise this new restaurant, but strange to say we have passed through the low, broad doorway of an ancient Mexican temple and are surrounded by its mosaic-ornamented walls.

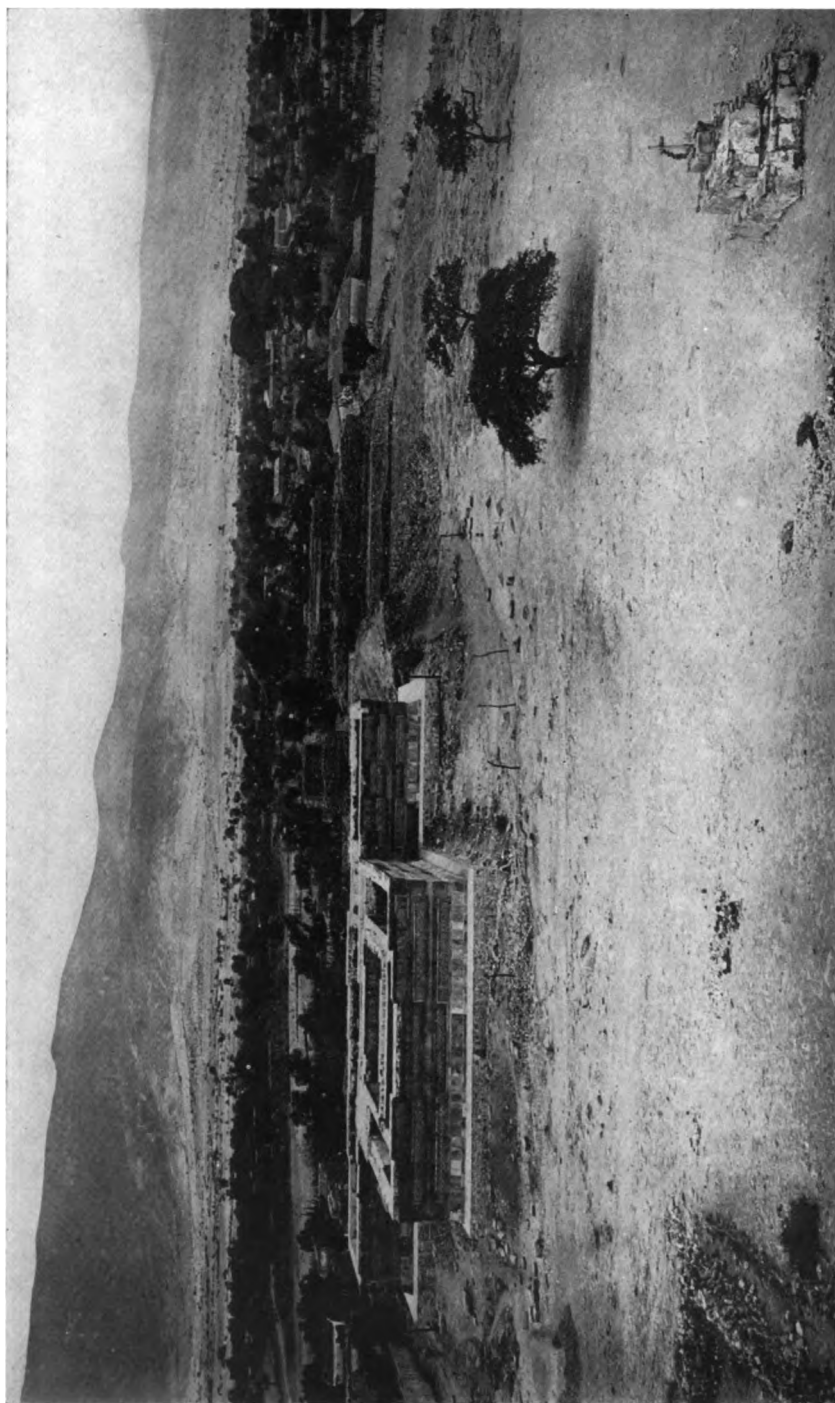
To see the original in its prime, we must have lived centuries before the Spanish conquest and have known a race which even before the times of the Toltecs had developed a culture, at least a temple building art, far exceeding that usually ascribed to the native races of this hemisphere. To look upon the ruins of this original to-day we should need to travel to southern Mexico. There, thirty miles by stage from the large city of Oaxaca, we should come to the town of Mitla, a modern little place with thatched houses and cactus fences, lying in a great amphitheater-like valley surrounded by mountains. The stage ride leads through broad green valleys dotted with farms and villages and set here and there with signs of occupation at some time far past. As we approach Mitla, the surrounding hills show much of the gray and greenish colors of trachyte, an ancient volcanic rock. When we reach the town, we find the market place and some of the public buildings constructed of this trachyte, which probably was taken from its abiding place in the cliffs more than a thousand years ago and used in successive building operations by the predecessors of the homely Zapotecan race now living here.

Mitla has long been known as the site of some of the best preserved

and most remarkable ruins in all Mexico. Who the people were that erected the buildings and whether the structures were intended for palaces or temples is unknown, but the architects and builders were wonderful for skill and boldness in design and execution, and they were not averse to work. They brought the trachyte from the hills, a stone that is soft and easily broken into great blocks, but yet is tough and durable; they obtained adobe from the immediate vicinity to be used in the foundations in setting the stone; they transported lime, probably from some outcrop in the valley, and mixed it with gravel to make cement or concrete for the laying of floors and pavements; they procured paints, mainly by mixing whitish earth and iron oxides, the colors preferred being white and several shades of red, and they cut great trees to get logs for long spans in ceilings and roofs. Because of the limit set by the length of a single roof beam, they built most of their chambers long and narrow, though they sometimes set stone columns through the middle of a chamber to double the span.

In raising the walls they cut the margins of the stone blocks so accurately that the joints required little or no mortar. The wonderful fact is that they did little simple stone laying, but instead prepared every block to fit into a particular place, so that each additional layer in the walls differed from its neighbors above and below in width, angle or projection. Most remarkable of all is the manner in which these builders ornamented their structures with geometric designs made out of innumerable little pieces of stone, each of which was cut and shaped to fit into the formal pattern of the mosaic. It is estimated that about 15,000 pieces of hewn stone were used for the inside walls of one of the small chambers of the Quadrangle of the Grecques.

To appreciate the new restaurant fully, we must know the plan on which the Mitla temples that furnished its inspiration were built. There are traceable in the ruins five groups of structures. Throughout these the ground plan is a formal quadrangle, presenting a series of central courts each surrounded by four chambers. The best preserved of the structures is the so-called Group of the Columns, particularly interesting because its great central court (about 150 feet square, probably once holding a shrine at its center) was supposedly bounded by four wide halls, each of which gave entrance into a smaller quadrangle of four rooms around a less spacious court. The best preserved of these wide halls is that on the north, the so-called Hall of the Six Columns. It is





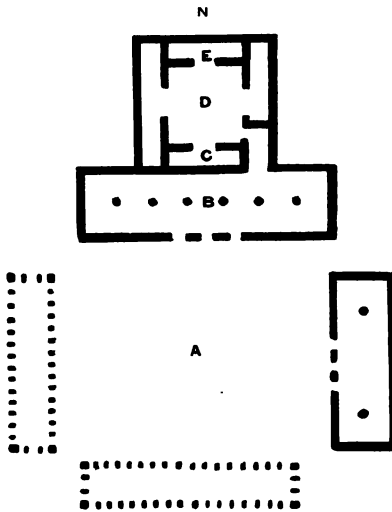
MAIN ROOM OF THE MUSEUM RESTAURANT
 Reproduction of the Court of the Quadrangle of the Grecques, Mitla. (D of the plan on page 99)

the quadrangle entered from this hall, the Quadrangle of the Grecques, that the Museum has in part reproduced, including the court, 30 feet square, with its north and south chambers, the east and west rooms being omitted on account of the limited space available.

The reproduction was undertaken upon data given by Professor Marshall H. Saville who has made extensive studies of the ruins. While many desirable measurements were lacking, those supplied were suffi-

cient—augmented by good photographs—to secure accurate scales which were employed throughout the construction. The materials employed were selected with the object of avoiding the possibility of fire and at the same time of reducing to a minimum the danger of damage through use as a dining hall. The parts representing heavy masonry, to a height of about five feet, consist of stones cast in Keen's cement, backed with reinforced concrete, which insures both strength and hardness. Above this, where there is little danger of damage, the material used for panels and grecques is plaster strengthened with burlap.

Having obtained the measurements of each piece of stone or panel of mosaic, wooden forms were made, then modeled over with clay to gain the effect of the



GROUND PLAN OF THE "GROUP OF THE COLUMNS," MITLA

- A. Court of the Quadrangle of the Columns. B. Hall of the Six Columns. C. South Chamber of the Grecques. D. Court of the Quadrangle of the Grecques. E. North Chamber of the Grecques.

The Museum restaurant reproduces rooms C, D and E.

stone surface as shown in many samples from the Mitla ruins in the possession of the Museum. From these models, plaster or gluc moulds were made and cement or plaster casts run off as they were needed in construction. All parts were cast hollow, and by cementing each to its neighbor and anchoring all securely to the walls, the structure became both rigid and durable with a minimum of weight.

Thus visitors to the Museum may see an old Mitla temple as it used



REPRODUCTION OF THE NORTH CHAMBER OF THE GRECQUES

Stained glass windows in the north and south rooms represent pre-Columbian mythological figures taken from an ancient codex

to look,— the same low doorways of simple structure at the centers of the walls between court and rooms, the same court walls covered with horizontal panels of mosaic, and those of the chambers, except for a dado of masonry, made up completely of grecque patterns. The rooms off the court have been provided with stained glass windows made by the artist, Mr. Will S. Taylor. They represent mythological designs taken from the Codex Magliabecchiano XIII, 3. Similar mythological figures have been painted on the backs of the chairs by the same artist. That the new restaurant is of unusual interest as an exhibition hall arises not only from the fact that it sets down in the heart of New York an exact reproduction of an ancient temple of Mexico, but also because the Mitla structures themselves in many features of construction as well as in the system of ornamentation stand alone not only in the general region represented but even in the small province to which they belong.

TWO NEW BIRD GROUPS

TWO new habitat bird groups have recently been opened for exhibition, and there are now but few breaks in the circuit of the gallery that these groups occupy. The one first completed, "Cuthbert Rookery," on the west side of the hall, is among the largest of the series, and represents a portion of a Florida Heron rookery, the sort of Florida bird gathering best known to the world because of the economic interest attached to aigrette-bearing herons. The foreground shows these herons — six different species and several individuals of each species — nesting among thick-growing mangroves, while the background, painted by Mr. Bruce Horsfal, pictures the whole-islet of the rookery as it appears at sundown. Hundreds of birds are settling among the mangrove branches that literally roof over the islet with green. Gray Louisiana and Little Blue Herons make up a colony by themselves at the left. Roseate Spoonbills, conspicuous because of their color, approach and occupy a portion of the islet at the right; and everywhere, except in these preëmpted spots, are the representatives of the other three species, American Egrets, Snowy Egrets and Ibises. At the time the studies were made for the group, March 29, 1908, it was estimated that this rookery was the home of about 3,000 birds, 2,000 being Louisiana

Hérons and 350 American Egrets, while only 15 were Snowy Egrets and 35, Roseate Spoonbills.

The rookery from which this group was copied is the only one remaining of the many that existed twenty-five years ago. All the others have given way to the slaughter wrought by egret hunters, this one escaping because of its inaccessibility. Cuthbert Rookery is in the heart of the mangrove swamp that borders the Everglades at the extreme southern part of the State. The large boat which carried the Museum expedition could approach only within seven miles, because of the shallowness of the water, and small boats had to be laboriously pulled and pushed through the brackish brown water of the remaining distance.

This is the rookery where Warden Guy Bradley was shot in the summer of 1905, while on duty guarding this last stronghold of the herons. The island to-day is unprotected and the birds, rare now, are liable to meet extermination in the near future. If the visitor to the Museum has previously read either Mr. Chapman's experiences at Cuthbert Rookery as given in "Camps and Cruises of an Ornithologist" or those of Mr. H. K. Job as set forth in his book "Wild Wings," he will see the Cuthbert Rookery Habitat Group with greatly enhanced interest.

The second of the two groups, the Turkey Buzzard or Turkey Vulture, that on the east side of the hall, presents a sharp contrast to the Cuthbert Rookery group in that it shows but one bird with its young, instead of a vast gathering of birds and many nests. Notwithstanding this, the Turkey Buzzard group is one of the most satisfactory of the whole twenty-five now completed.

The series of habitat groups of North American birds was designed not only to show the haunts and habits of the birds, but also to include in the painted backgrounds representations of the land types of American scenery. Until the Turkey Buzzard group was completed, the series did not show the wooded shores of an Atlantic slope river. The locality selected to fill this gap is on the Potomac, ten miles above Washington, where the river flows through heavy deciduous forests.

The success of the new group, however, does not lie only in depicting in a strong, simple way the home life of this bird, rare in the North, not only in setting forth an added sort of American landscape, but also and strikingly in the effect of the whole as a work of art. As we stand before the group, the scene is very real, quite as though we had climbed the rocky





TURKEY BUZZARD HABITAT GROUP

Studies for this group were made on the Potomac River, ten miles above Washington

cliffs and, from the height, surrounded by all the details of the life there, were looking up the river and to the opposite shore. The picture spread out before us has atmosphere, an achievement due both to the work on the painted background and to the conception carried out in the foreground. A haze rests over the green wooded hills that slope down to the Potomac and are imperfectly reflected in its muddy, slow-moving water. Close at hand, the gray lichen-spotted rocks that make up the cliffs of the near shore are here and there covered with poison ivy and Virginia creeper. Fern and hepatica, growing among dead leaves fallen from an overhanging chestnut oak, fill the crannies of the rocks.

In one of the larger of the crevices of these rocks two white down-covered birds stretch up their heads and spread their wings in supplication to a parent bird that has just alighted on a rock above them. We realize in looking at these young birds the wisdom of the instinct which makes them "lie low" in the nest, for we feel, almost with a sense of dizziness, so realistic is the group, how precipitous are the walls that extend from the nest to the water far below. The Turkey Buzzard has a longer period of family life than many birds. The time of incubation for the two heavily-spotted eggs is about thirty days, and the young must know for fully two months a world limited to the rock and dead leaves of the niche in which they first opened their eyes, although as their vision is perfected, they see the dome of the sky and the wooded heights of the river.

The Turkey Buzzard is an abundant and well-known bird at the South, where it does good service as a scavenger and is protected both by law and public sentiment. The studies for the group were made by Mr. Frank M. Chapman and Mr. J. D. Figgins in May, 1909, at Plummer's Island. The background was painted by Mr. Hobart Nichols from his own sketches, made on the ground. Plummer's Island is locally interesting as the home of the Washington Field Naturalists' Club, to which organization the Museum is indebted for many courtesies extended.

For these two groups the Museum expresses gratitude to the same Members whose generous contributions have made possible the whole series: Mr. John L. Cadwalader, Mrs. Morris K. Jesup, Mrs. Philip Schuyler, Mrs. John B. Trevor, Mrs. Robert Winthrop, Mr. F. Augustus Schermerhorn, Mr. H. B. Hollins, Mr. Henry Clay Pierce, Mr. Henry W. Poor and Mr. Courtenay Brandreth.

COLD SPRING HARBOR GROUP

THE group shown in the photograph on page 107 is being installed in the Darwin Hall of Invertebrate Zoölogy and represents a typical association of animal life, such as may be seen between tides on the Long Island shore. The scene is laid at Cold Spring Harbor, and the studies were made during the month of April.

A crowded mussel bed (*Modiolus plicatula*), rather thinly covered with sprouting "spartina" grass, is overrun by fiddler crabs of two species (*Uca pugillator* and *Uca pugnax*). At the extreme right of the group are two sections of fiddler-crab burrows, occupied by their tenants. The water is shown at half-ebb tide, while underneath its surface are clusters of the edible mussel (*Mytilus edulis*) and of the common oyster (*Ostrea virginica*). Upon one of the oysters is its arch enemy, a starfish (*Asterias forbesii*). With arms extended over the shell of the oyster and with innumerable tube feet firmly attached and in a state of tension, the starfish is steadily straining to pull apart the valves of its gradually weakening victim. Scattered about on the sea bottom are those scavengers of shallow water, the sea snail (*Nassa obsoleta*) and the hermit crab (*Eupagurus longicarpus*). Two of the crabs are fighting over a dead fish, while lurking here and there may be seen the mud crab (*Panopeus herbstii*). In the center, adhering to an oyster shell, are several specimens of the tube worm (*Hydroides dianthus*) with expanded gill circlets of brilliant color. At the lowest part of the group in the foreground, the mud of the sea bottom is cut in vertical section to show the long or soft clam (*Mya arenaria*) upright in its burrow, its protruded siphon reaching upward to the water.

The background of the group gives a good effect of distance produced by an arrangement of colored photographic transparencies showing an actual view of the harbor. The materials were collected and the field studies made by Dr. F. E. Lutz. The group was mounted by Mr. Ignaz Matausch, with the assistance of Mr. Dwight Franklin and under the direction of the Department of Invertebrate Zoölogy.

ROY W. MINER.



THE STEFÁNSSON-ANDERSON ARCTIC EXPEDITION

ON February 18 letters were received at the Museum from Mr. V. Stefánsson and Dr. R. M. Anderson, who are now spending their second winter on the Arctic coast of North America. Their experiences are best related in their own words, although their letters give only a hint at their lives. Mr. Stefánsson writes as follows:

HERSCHEL ISLAND, August 18, 1909.

I arrived here this morning to find that there is opportunity to send out mails this evening, with no sure opportunity after that till December. * * * * My last report to you was from Barrow in May. * * * * A day or two after the date of it I left Point Barrow, going east with two dog teams of five animals each, and three Eskimo. On one sled was the skin umiak, which we later found capable of carrying 3500 lbs. in smooth waters, on the other our camp gear and some ammunition purchased from Mr. Brower for use in the event of our supplies not arriving. When we reached Smith Bay we found that Dr. Anderson, with one team and two Eskimo, had commenced hauling eastward what stuff there was left in our cache at Smith Bay. For three days we worked together carrying our outfit forward, but on May 28 I detached three Eskimo with one sled to proceed as fast as possible to our other cache at Barter Island to take care of it during the spring thaws. * * * * On June 12 sledding operations were stopped some fifteen miles west of Colville by water on the ice,—travel resumed June 23 by umiak in open water. June 26 to July 8 was spent on Colville River, much of time in camp with Colville Eskimo, some of whom I had not seen before. * * * *

East of the Colville we were delayed an aggregate of five days by ice, strong head winds and some annoying, if not serious minor misfortunes. Arrived at and departed from Flaxman Island August 5, but were delayed two miles east of there two days; here were met by our whaleboat and Eskimo from Barter Island and journey now proceeded more smoothly. August 18, myself and the umiak were picked up about twenty miles west of Herschel Island yesterday by Capt. C. T. Pedersen, schooner "Challenge," and brought here to-day, while Anderson and whaleboat could not be taken on and therefore follow. Capt. Pedersen expected to stay here two days, giving me ample time to write letters, but reports of whales take him out again to-night.

The main energies of the summer have been taken up with getting eastward; we still have hopes of getting as far as Cape Parry, which will put us

in striking distance of the Coppermine by sled (about 300 miles). Some ethnological information has been gathered here and there incidentally, Dr. Anderson has a number of sets of eggs and bird skins. * * * *

I leave a good many things unconsidered and turn to the future. If we fail to reach the Coppermine or Victorialand districts I shall not accept the verdict as final. * * * * I shall make the winter as useful as I can among the Cape Bathurst natives, if we are forced to winter there. They are almost as unknown scientifically as any Eskimo, although not as "unspoilt" perhaps.

HERSCHEL ISLAND, August 19, 1909.

* * * Shortly after finishing yesterday's letter, and as Capt. Pedersen was about to sail, the "Karluk," Capt. Cottle, came in from Barrow. He had sighted the "Hermann" (supposedly carrying my freight) but had had no communication with her; believes neither the "Hermann" nor any other ship will come in this year; and intends himself to winter in the Arctic, but cannot say where. It is therefore clear we shall receive none of the supplies sent by you. * * * *

Capt. Cottle will take me and the two Eskimo I have with me as far east as he can and land us. There we shall fish and hunt against the winter. I leave instructions for Anderson to follow in the whaleboat, and if he is frozen in west of where Capt. Cottle lands us, say, Cape Parry, he can sled east to find us. It seems to me now the chance is fair of our getting to the Coppermine after all. * * * *

Dr. R. M. Anderson, the biologist of the expedition, writes more briefly, being greatly pressed for time, as follows:

HERSCHEL ISLAND, August 22, 1909.

I arrived here to-day from the west with the whaleboat, having been stormbound for three days within sight of the Island. Mr. Stefánsson's boat had preceded us by a few hours, while our party was looking for a lost dog. Mr. Stefánsson sailed yesterday on board the steamer "Karluk." * * * * I shall follow at once through the Mackenzie delta in the whaleboat. If frozen in before reaching Cape Parry, we shall proceed by sled to join Mr. Stefánsson. * * * * Capt. Pedersen's schooner is to sail at once for Point Barrow, so that my official report of operations since Oct. 20th, 1908, will have to go out via Dawson the coming winter. My specimens including seven skins with heads of *Ovis dalli*, and fifteen Caribou, mainly from Colville region, will have to remain here until another ship comes in or the "Karluk" goes out.

DARIUS OGDEN MILLS

AT the annual meeting of the Board of Trustees the following resolutions were passed with reference to Mr. D. O. Mills, who died January 3, 1910:

This Board records with sorrow its tribute to the late

DARIUS OGDEN MILLS

for twenty-eight years one of its number.

Mr. Mills was elected a Trustee February thirteenth, eighteen hundred eighty-two, and a year later was made a member of the Finance Committee, on which he continued to serve until his death. He was one of the four members of the committee appointed in eighteen hundred ninety-two to consider arrangements for educational coöperation. He also served on the Nominating Committee and was its Chairman for over fifteen years.

The Museum is indebted to Mr. Mills for many generous gifts.

Since the foundation of the Museum forty-odd years ago many prominent and distinguished men have served on the Board of Trustees, but none whose presence was more welcome than that of Mr. Mills. Quiet and gentle in his manner, sound in judgment and wise in counsel, modest and simple but full of good sense, just and true in every dealing, he was loved and appreciated by all who knew him. His death on January third leaves his fellow Trustees of this Board with a feeling of profound sense of loss and with the greatest admiration for his fine and lovable qualities of character.

REPORT FROM THE FABBRI YACHT

THE yacht "Tekla" which has been cruising in the waters of southern Florida, under command of her owner Mr. Alessandro Fabbri, in behalf of the Department of Fishes has succeeded in obtaining many interesting forms which are new to the Museum's collections, and the Messrs. Fabbri are carrying on the work with great energy and enthusiasm and expect to take plaster moulds from fishes which can be captured a little later in the season. By invitation of the Messrs. Fabbri the writer had the privilege of accompanying the yacht as the Museum's representative.

The most effective apparatus for getting specimens proved to be a large seine. This was especially useful on smooth sand bars sloping down into water of moderate depth. At times a strong current and the mud at a river's mouth would make the seine almost too heavy to draw, or some huge snag would anchor it to the bottom temporarily, but the results obtained fully compensate for the trials and labor of its operation. A small hand seine yielded good results where the large one could not be used, and variously improvised dip-nets turned up rare things from the tide-pools and shallows. Off shore specially constructed beam-trawls were used without great success, owing to the treacherous nature of the bottom. Yet the beam-trawl turned up several forms of life not obtained in any other way.

Collecting off shore from a small boat was highly profitable, when, on fine warm days, light airs from the south and east wafted Gulf Stream conditions into the very harbor of Key West, driving in the colored, bubble-like floats of the Portuguese-man-of-war (*Physalia*), the little violet snail (*Ianthina*) and masses of gulf weed (*Sargassum*). A fine series of *Nomeus gronovii* was obtained. These little fishes swim about under the float of the Portuguese-man-of-war, receiving protection through the powerful sting of its host's long tentacles. It is easy to dip up *Physalia* and fishes together in a net and carefully disentangle and throw back the *Physalia* without getting stung. The small fishes are very beautiful, but their black, blue and silver colors do not keep well in preserved specimens. Swimming among the Portuguese-man-of-war were also the very young of the amber jack, pretty little banded fishes scarcely an inch long, as well as small schools of scad, *Trachurus trachurus*. This latter fish, abundant and an important food fish in Europe, is considered rare on our coast. The young are probably common enough here where the Gulf Stream washes the shore of Florida.

Many of the fishes collected about Key West range southward among the West Indies. At Cape Sable, where much collecting was done, there is a predominance of forms that range along the South Atlantic coast, from about Cape Hatteras, or even Cape Cod, to Texas, but it was a surprise to find the blow-fish (*Spheroïdes*) obtained there identical with the one so common about New York in summer, whereas a quite different species was found common at Miami and a third form was abundant at Key West.

Unquestionably the most interesting region visited was the edge of the Everglades. The "Tekla" anchored several miles up Shark River, among the mangroves, and shallower waters still farther up stream were explored with a launch and row boats. In the weed-choked shallows various interesting small fishes characteristic of the region and new to the Museum's collections were very abundant. These forms are preyed upon by larger fishes, of which the leathery spotted gar (*Lepisosteus*) was most in evidence. It was here that some unusually small specimens of the great tarpon were obtained with rod and reel.

Common, though seldom seen, a rather large gray shark (*Carcharhinus lamnia*) with broad, blunt head and a formidable array of saw-edged teeth, prowls about the wharves and shipping in the harbor of Key West. Several of these sharks were caught. From the number a fine specimen eight or nine feet long was selected, and plaster moulds for a cast were made from it. When placed on exhibition in the Museum, the cast will doubtless attract no little attention, as will also the cast of a jew-fish, a huge bass of the sea, weighing some hundreds of pounds. The moulds taken from this latter fish have already been safely received at the Museum.

JOHN T. NICHOLS.

MUSEUM NEWS NOTES

THE bequest of Miss Phebe Anna Thorne to which reference was made in the January number of the JOURNAL has been paid over to the Museum and has been applied as an endowment to the Museum's room for the blind. Messrs. Samuel and Jonathan Thorne, the executors of the will, feeling that this use of the legacy was so thoroughly in accord with their sister's interest and desires have increased the amount from ten thousand to twenty-five thousand dollars, out of the residue estate, thus insuring a permanent income for the development of this new and extremely useful and promising branch of the Museum's work. The Trustees have established a committee on the Museum for the Blind consisting of Hon. Seth Low, Mr. A. D. Jouillard, Dr. H. C. Bumpus and Professor Henry F. Osborn.

THE Museum has received and added to its permanent endowment fund the sum of one hundred thousand dollars which was bequeathed to it by the late Mr. Darius O. Mills.

Since our last issue the following persons have been elected to membership in the Museum: Patron, HON. GEORGE W. WICKERSHAM; Life Member, MR. FREDERICK A. LUCAS; Sustaining Members, MESSRS. FRITZ ACHELIS and ALFRED E. MARLING; Annual Members, MESSRS. M. W. AMBERG, CHARLES EBERHART, B. TAPPEN FAIRCHILD, H. C. FLEITMANN, JAMES GUTMANN, E. G. LOVE, BRADLEY MARTIN, JR., HOWARD NOTMAN, FRANKLIN SIMON and AUGUST ZINSSER, JR., REV. PERCY STICKNEY GRANT, DR. E. LYELL EARLE, MMES. CADWALADER JONES and HENRY D. WHITFIELD and MISSES LEÓNIE M. GALLOT STAMM and CATHERINE A. STEVENS.

MR. FREDERICK A. LUCAS, Curator in Chief of the Brooklyn Museum, has been elected a life member of the American Museum on account of the practical assistance which he has rendered the latter institution and because of his contributions to science.

THE magnificent elephant head which was collected by Mr. Richard Tjäder in German East Africa in 1906 and which has been on exhibition at the Museum for the past two years as a loan from Mr. Samuel Thorne has been transferred to the Heads and Horns collection at the Zoölogical Park in Bronx Park.

ADVICES received late in February from Mr. Roy C. Andrews, who has been cruising for the past six months on the steamer Albatross of the United States Bureau of Fisheries, gave an account of an interesting and profitable journey among the Philippine Islands, the Moluccas, the Celebes and along the coast of Borneo. Many valuable photographs of natives have been obtained, including moving picture films of dancing "Dyaks" at Amboyna, Moluccas. Ethnological material, too, was obtained from several islands, part of which was generously presented by His Excellency, Baron Quarles de Quarles, Governor of the Celebes.

NEWS from Messrs. Lang and Chapin, of the Museum's Congo expedition, has come in the form of letters and post cards which were ten weeks or more on their journey from the heart of Africa. Mr. Lang's

official report is stated to be on its way to New York, but it has not arrived yet. When the letters were despatched, late in November, 1909, the Museum expedition was making its headquarters at Avakubi, twenty-six days' march up the Congo River from Stanleyville. Most of this march was through the dense tropical forest and was extremely trying, not only to the white men but also to their native porters; nevertheless, all are in excellent health. Avakubi is an important rubber station, about twenty tons per month being received in payment of taxes from the natives, who also bring in many fine elephant tusks. The expedition has been successful in collecting hundreds of perfect skins and skeletons of mammals and birds, besides photographs and other data for use in preparing habitat groups.

On the evening of Friday, March 11, Commander Robert E. Peary, U. S. N., presented to the members of the Museum a thrilling account of his discovery of the North Pole, illustrating his address with many excellent photographs made by him while on the expedition. On account of the great popular interest in Commander Peary's work it was necessary to restrict admission to those holding Members' tickets. Even under these conditions six hundred persons were turned away from the auditorium.

From Wednesday to Friday, March 16 to 18, inclusive, the Horticultural Society of New York held its spring exhibition in the Columbus Avenue wing of the Museum. The event was made more noteworthy even than usual through the coöperation of the American Rose Society, which held its annual convention and exhibition here at the same time.

THE National Association of Audubon Societies held its annual meeting at the Museum on March 17. The convention was signalized by the principal address, which was by Mr. Donald B. McMillan upon "The Bird Life of the Arctic." Mr. McMillan will be remembered as one of the scientific staff that accompanied Commander Robert E. Peary on his successful North Polar expedition last summer.

THE HONORABLE GIFFORD PINCHOT unfortunately was unable to fill his engagement to address the Members of the Museum on March 24, but his place was filled by Dr. W J McGee, Secretary of the Inland Waterways Commission and member of the National Conservation Commission, who spoke upon "The Conservation Movement," which was the subject originally assigned for the evening.

LECTURE ANNOUNCEMENTS**PEOPLE'S COURSE**

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Lectures illustrated with stereopticon views.

- March 1.—MR. LOUIS F. BERRY, "Spain."
March 8.—DR. JOHN C. BOWKER, "Portugal, a Cluster of Grapes."
March 15.—MR. C. J. BLANCHARD, "Winning the West."
March 22.—MR. FRANK A. GALLUP, "Greece as It is To-day."
March 29.—MR. FRANK A. GALLUP, "Italy and the Italians."
April 5.—DR. GEORGE R. VAN DE WATER, "To the Heart of the Dolomite Region."
April 12.—DR. GEORGE R. VAN DE WATER, "From Cortina to Botzen, over Pordoi Joch Pass."
April 19.—DR. GEORGE R. VAN DE WATER, "The Stelvio Pass."
April 26.—MR. ALFRED J. TALLEY, "The Passion Play."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. Lectures illustrated with stereopticon views.

- March 5.—MR. A. EMERSON PALMER, "Development of Public Education in New York City."
March 12.—MR. H. SNOWDEN WARD, "The Humor and the Pathos of Charles Dickens."
March 19.—HON. JOHN J. MURPHY, "The Tenement House Department."
March 26.—HON. CHARLES N. CHADWICK, "Our New Water Supply."
April 2.—HON. CHARLES B. STOVER, "The Park Department."
April 9.—HON. LAWSON PURDY, "The New York Tax Department."
April 16.—HON. MILO R. MALTBY, "The Public Service Commission."
April 23.—Subject and lecturer to be announced.
April 30.—Subject and lecturer to be announced.

Children are not admitted to the lectures of the People's Course, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES.

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

First Mondays, Section of Geology and Mineralogy;
Second Mondays, Section of Biology;
Third Mondays, Section of Astronomy, Physics and Chemistry;
Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

The Linnæan Society of New York;
The New York Entomological Society;
The Torrey Botanical Club.

On Wednesdays, as announced:

The Horticultural Society of New York;
The New York Mineralogical Club.

On Friday evenings, as announced:

The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.
MARY CYNTHIA DICKERSON, *Associate Editor*.

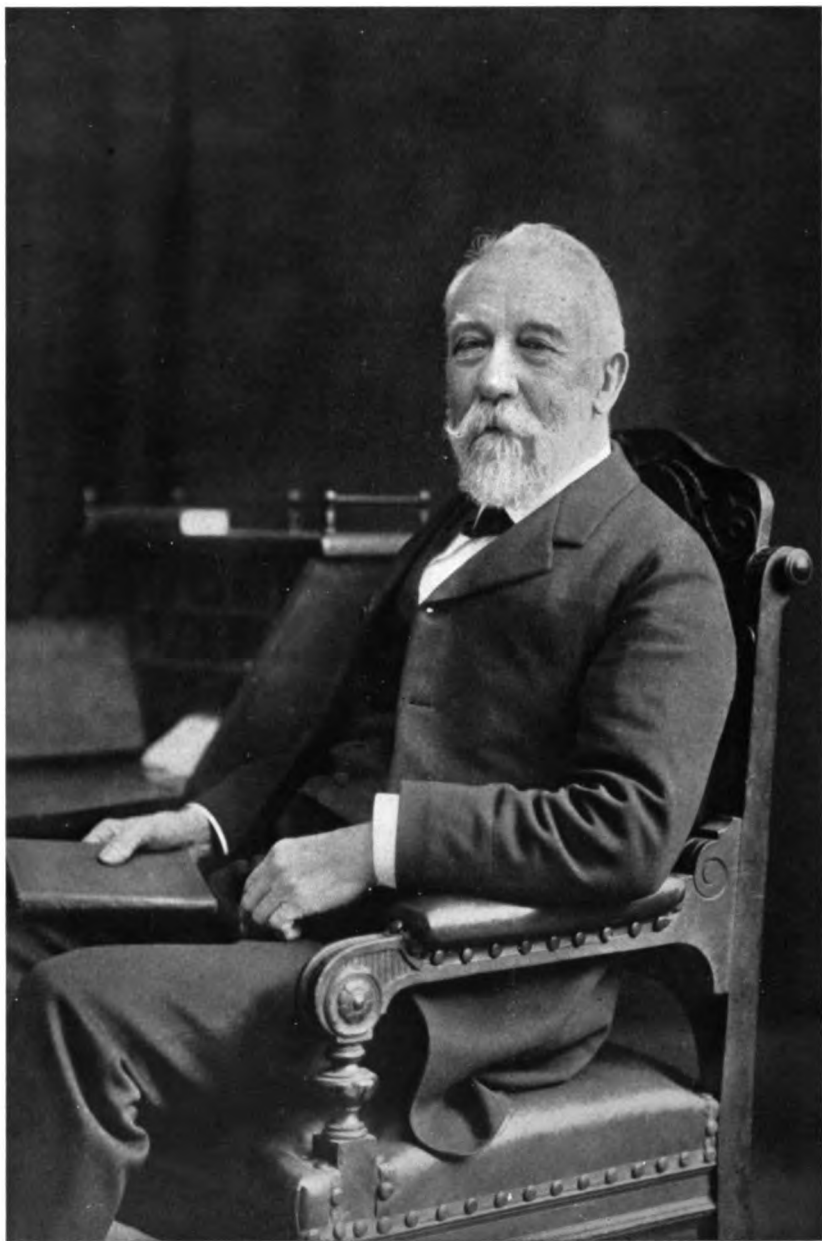
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ROBERT PARR WHITFIELD

Curator of Geology and Invertebrate Palaeontology, 1877-1909

The American Museum Journal

VOL. X

MAY, 1910

No. 5

ROBERT PARR WHITFIELD

ROBERT PARR WHITFIELD, Curator Emeritus of Geology and Invertebrate Palæontology, died on April 6 after a long illness. Coming to the Museum while still in the prime of life, he rendered most faithful service to the institution for thirty-three years and did his full share in placing it in its commanding position in the scientific world.

He was born at New Hartford, Oneida County, New York, May 27, 1828, and therefore came from a region which has furnished several of the most famous geologists and palæontologists of America. At the age of nine, the boy began work in a cotton mill, later entering the shop of his father, who was a spindle maker. When he was twenty, his father gave young Whitfield his time, and he was employed by Samuel Chubbuck, a well-known manufacturer of philosophical instruments at Utica. His spare moments were spent in collecting the fossils for which the region around that city is famous and in preparing, mounting and studying them, his interest in natural history having been aroused and fostered in very early life by an English nurse who was in the family. School education did not fall to his lot; in fact, as he has stated in conversation with the writer, his entire school training amounted to less than three months of time in all, and he never saw the inside of a school house as a student after he was twelve years old. Hence Professor Whitfield's career as a scientist is even more remarkable than it would have been, if he had had the advantage in early life of the scholastic and other training that has fallen to the lot of the majority of men who have attained eminence in science.

In the early fifties, Professor James Hall heard of young Whitfield's collection, visited him and saw the scientific promise in the young mechanic. When, therefore, poor health obliged him to give up his work in the shop in 1856, Professor Hall was glad to get his assistance on the Natural History Survey of the State, and Mr. Whitfield removed to Albany, where he remained as an assistant in palæontology and geology

for more than twenty years. When the great James Hall Collection of fossils was purchased for the American Museum, the services of Professor Whitfield were secured for its care, and he entered upon his duties as Curator of Geology in January, 1877, being the only curator that the institution then had. His first year was devoted to arranging the geological and palæontological material in the exhibition hall assigned to it in the new building of the Museum, and when this building, which is now known as the North Wing, was opened to the public, December 22, 1877, the collections in his charge were by far the most important from a scientific standpoint among all the possessions of the Museum.

Throughout his whole career, the mechanical skill developed in the tool and instrument shops stood Professor Whitfield in good stead, and it was of material assistance to him in the development of his talents as a draftsman. His first efforts at making drawings for publication were in the delineation for the State Survey of the correct relations of the complicated remains of fossil crinoids, or sea lilies. He soon surpassed the other draftsmen in the accuracy of his observations and in the skill and brilliancy with which he used his pencil in representing fossil forms, and it was not long before he became the head draftsman of the Survey. In this capacity he executed several thousands of drawings before the termination of his connection with the organization. This training as a draftsman was of material assistance to Professor Whitfield in all his studies. His recognition of old and new features amounted almost to an instinct, and there is little question that for nearly half a century he had no superior in this country in the identification of fragmentary invertebrate fossils.

In addition to his work for the State of New York and this Museum, he studied and described the fossils which were gathered by the Clarence King Geological Survey of the Fortieth Parallel, Jenney's and Ludlow's expeditions to the Black Hills of South Dakota and much of the material gathered for the geological surveys of Ohio, Indiana, Wisconsin and New Jersey.

Soon after he came to the Museum, he began to urge the establishment of a medium for the publication of the results of the scientific work done in the Museum. This led to the institution, in 1881, by President Morris K. Jesup, of the Museum "Bulletin," the first five articles of which, comprising all that was issued during the first year of its existence,

were prepared by Professor Whitfield. In the succeeding years, he contributed many articles to the pages of the "Bulletin," and the last piece of work that he did in connection with his department was the preparation, during the latter half of last year, of the text and drawings of the descriptions of several new species of fossil shells from the Mt. Lebanon district of Syria. The drawings, to be sure, show the effects of advancing age and infirmity, but nevertheless they indicate clearly the master hand that prepared so many thousands of antecedent figures.

Although never a man of strong physique, Professor Whitfield usually enjoyed good health and was able to accomplish an immense amount of work. The Hall Collection of fossils was his idol, and its care and interests were constantly on his mind. Naturally methodical and systematic himself, the arrangement of the collection reflected these characteristics of the man and was the joy of the visiting scientist who desired to inspect a particular species with or without the assistance of the curator. Almost punctilious in his attention to duty and to his ideas of Museum work, he was always to be found either in the exhibition hall or in the laboratory, never going away on collecting expeditions except within the limits of his usual brief vacations. Remaining actively engaged in his department to within so short a period of his demise, his removal means much to the Museum and his familiar figure and his counsel will be greatly missed.

EDMUND OTIS HOVEY.

THE DODGE EXPEDITION TO MISSISSIPPI

THE Museum collection of fishes is poor in "ganoids"—sturgeon, gar-pikes, amia, shovel-noses and spoon-billed catfish or paddlefish—and it has seemed desirable that this ancient group should be exhibited adequately in the Hall of Fishes. One reason for the interest in "ganoids" is that they are known to be the race of fishes from which all the modern types such as perch, cod and salmon are descended. Accordingly, thanks to the aid of the Dodge Fund, an expedition was sent in March to spend several weeks in a region which is peculiarly rich in these rare forms for the purpose of obtaining material to show their structure and development. In the northwestern corner

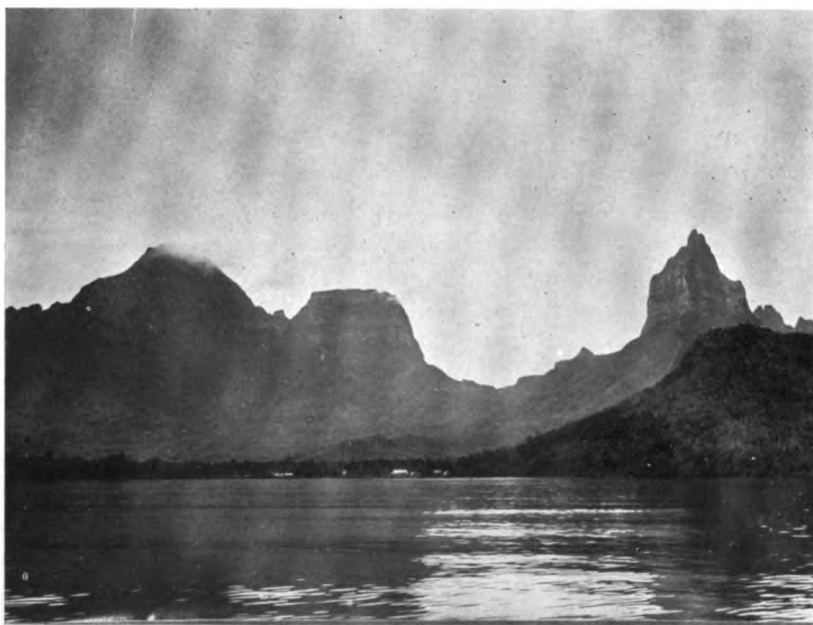
of the state of Mississippi there is an extensive fishery of the paddlefish (*Polyodon folium*) which is in charge of Mr. J. E. McGehee, a friend of the Museum, who put at its service his launches, fishermen and nets. There was thus offered an unusual opportunity for securing the desired collection, which was further improved by the fact that during the present spring a lake, Moon Lake, was to be fished, which had not been netted before. The collecting party consisted of Dr. L. Hussakof and Mr. Dwight Franklin. They report excellent success in collecting specimens and in obtaining casts and color studies which will ultimately be used in the preparation of habitat groups.

A FOURTH JOURNEY TO THE SOUTH SEAS

DURING the years 1906 to 1908, inclusive, I made three voyages to Tahiti and the other islands of the Society group, under the auspices of the American Museum and of the Carnegie Institution of Washington. The purpose was the investigation of the land-snails of these islands, and each year the results proved so unexpectedly satisfactory that further explorations were found desirable and were accordingly planned and carried out. My fourth journey, that of 1909, extended over about 15,000 miles of the Pacific Ocean and involved travels in seven groups of islands (the Society, Cook, New Zealand, Tongan, Samoan, Fijian and Hawaiian) while some of the Paumotus were seen in passing. My route is shown in the chart on page 125. The investigation of the land-snails of the Polynesian region was undertaken on account of the unusually favorable conditions for the study of certain evolutionary results and processes. Every biologist is familiar with Gulick's famous writings of the last quarter of the nineteenth century, in which he demonstrates that the Achatinellid land-snails of the Hawaiian Islands vary from valley to valley and from island to island of the group. As descendants of a common ancestral stock the different valley colonies and island types are the products of divergent evolution in correlation with their greater or lesser degrees of isolation. The efficiency of differing environmental conditions as actual factors in the process of species differentiation has been variously estimated by writers like Romanes, Jordan, Allen, Wallace and others, who have dealt with



PAPEETE AND THE NORTHWESTERN PART OF TAHITI



LOOKING SOUTH IN OPUNOHU BAY MOOREA SOCIETY ISLANDS

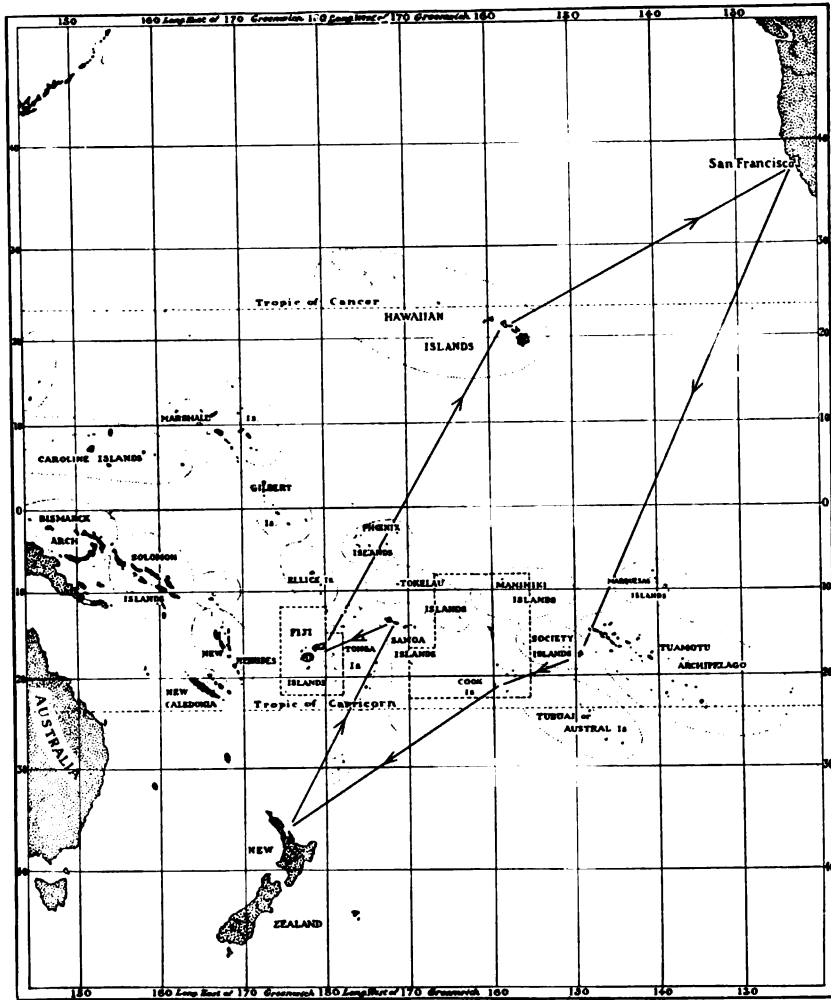
The impressive and strangely sculptured peaks are part of an ancient crater wall

similar phenomena displayed by other groups of organisms. Dr. A. G. Mayer made an initial biological study of the Tahiti land-snails belonging to the genus *Partula* and found remarkable differences between the valley colonies of this island. Advised by him to carry investigation further, I undertook the journeys mentioned, and the present brief account of the last one will give some of the general results of studies in the field and laboratory.

The first landing place as in previous voyages was the island of Tahiti, the largest and best known member of the Society Islands. Papeete is its main town, situated on the northwest coast, and like Suva in the Fiji group and Honolulu in the Hawaiian group, it is the governmental and commercial centre of the surrounding region of the South Seas. Its great prominence has been gained from Captain Cook's famous voyages in the eighteenth century and from the establishment here of the earliest missionary settlements in southeastern Polynesia. The town now has over 3,000 inhabitants, about three fourths of whom are natives. Cook's estimate of the population of the entire island made in 1768 was 240,000 whereas now there are less than 10,000 natives. Even if we allow for considerable exaggeration in his estimate there has obviously been a frightful mortality, resulting from their contact with white races and from the almost total destruction of their primitive scheme of life.

On approaching Tahiti, the island reveals itself as a magnificent double cone of ancient volcanic rock; the larger cone is twenty-five miles in diameter and rises to a height of nearly 8000 feet; it is joined by a low narrow isthmus to the smaller cone which is fifteen miles across. The view of the island near Papeete (page 123) shows also the characteristic mountain ridges whose central heights are covered by clouds from soon after sunrise to sunset. These ridges radiate with remarkable regularity from the interior to the sea, and the valleys between them are sometimes a half-mile in width, with dense tropical vegetation along the more level ground on either side of the streams. Sometimes the valleys are deep, narrow gorges with high, steep walls, bare of everything except low shrubs and grass. It is in the moist jungles of the valley bottoms that the *Partulas* live, and the higher and drier slopes form boundaries that restrain the snails from crossing to another valley, except during the wettest months of the rainy season.

More than two hundred valleys of smaller and larger size have been



ROUTE OF PROFESSOR CRAMPTON'S JOURNEY OF 1899

explored during my four journeys around and about the Society Islands. Over 100,000 specimens of snails have been obtained from Tahiti and the other five islands of the group — Moorea (see page 123), Raiatea, Tahaa, Huahine and Borabora. It was necessary to make a complete survey, in order that there might be no unknown gaps. On account of the high and rugged ridges which separate the valleys, it is very rarely possible to cross inland from one valley to another. It was my habit, therefore, to travel with my group of native assistants



TEVAITOA IN RAIATEA, ONE OF THE LEEWARD ISLANDS

A primitive village of the Society Islands

around the coast by canoe or whaleboat, or sometimes by carriage and on horseback, and to live literally among the natives in their primitive and interesting villages like the one shown on this page. Naturally it was possible to learn much of these people, their customs, their every day life and also their occasional ceremonies that the casual visitor to Papeete and similar large towns misses. A photograph is given on page 127 of one of their rare village fishing parties, undertaken in this case by the men of the entire district of Opoa in the Island of Raiatea.

The abundant collections in hand give a perfect demonstration of

the principles of geographical distribution. Each island possesses its own species, while its different valleys have forms that are usually markedly different. For instance, in the valley of Tipaerui of Tahiti the examples belonging to the species *Partula otaheitana* are almost all twisted to the right, and all of them are rather small, brown and streaked. Their relatives in the magnificent valley of Fautaua, a half mile distant, are larger, yellower and redder, but the fact of greater interest is that the shells of a large proportion of them twist to the left. In Hamuta



FISHING SCENE IN RAIATEA, SOCIETY ISLANDS

Distributing the fish caught for a district feast

Valley, just beyond Fautaua, the right-handed and left-handed members of the species are about equal in numbers, while in Pirai Valley beyond they are all left-handed. This last valley is the home of a small form, *Partula filosa*, that grows nowhere else in this island, in the group of islands or in the world.

When the collections are sorted out according to species and varieties and according to their geographical source, they give ample evidence to

prove that the divergent types of neighboring or distant valleys have arisen from common ancestors and that they have changed little by little, in one place and another, so as to become the distinct and characteristic types of their own neighborhoods. The evidence proves also that the snails have evolved primarily by "sporting," or mutation in the de Vries sense, and that the internal or constitutional factors are the potent ones, for the geological, climatic and general biological conditions are more uniform in these islands than anywhere else in the world. The



MANGAIA, ONE OF THE COOK ISLANDS

An uplifted coral limestone island

assignment of a secondary importance to environment is one of the principal results of my investigation.

A second result of equal importance is even more interesting. It is that the evolution of new types is taking place at the present time, as the evidence amply demonstrates in several instances discovered in different islands. My investigations give long-desired proof that the differentiation of species is going on under surroundings that are entirely natural

and not only under the artificial conditions of the laboratory and experiment station.

In June, July and the early part of August a final survey was made of certain baffling portions of Tahiti, Moorea, Raiatea and Huahine. I then passed on to the Cook Islands by a steamer which stopped long enough at Mangaia, Moki, Aitutaki and Rarotonga for a survey to be made of each place. With the exception of the last named, which is a "high" island like Tahiti, the Cook Islands are uplifted coral atolls



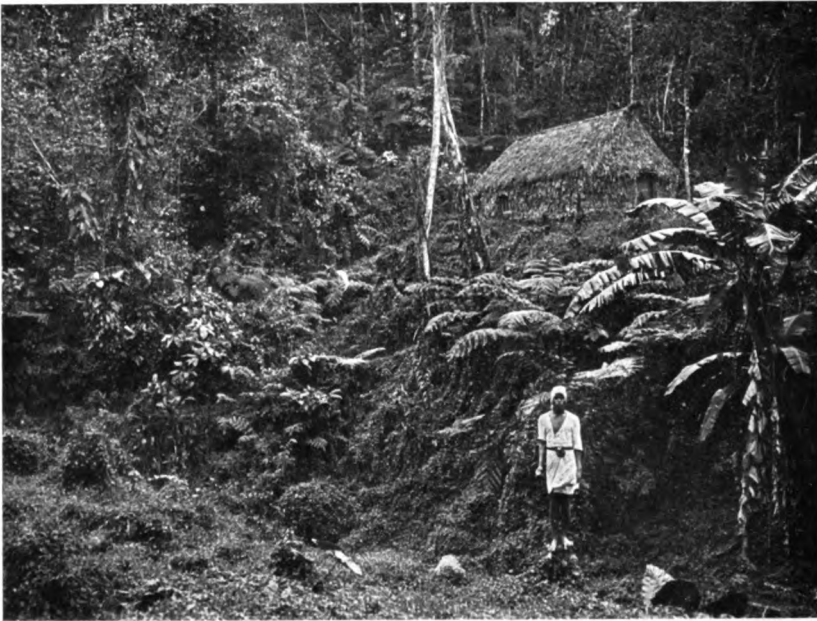
PAGOPAGO HARBOR, TUTUILA, SAMOAN ISLANDS

Showing part of the surrounding amphitheater of mountains

composed entirely of limestone. Mangaia, illustrated on page 128, is a typical example of such islands, which are relatively infrequent in the South Seas. These were originally low coral atolls scarcely rising above the surface of the ocean, and they were subsequently lifted by some geological power which raised the bottom of the ocean at this place, so that what were formerly the lagoons in the center became basin-like valleys. Earlier voyagers like Garrett and Cuming had reported certain species

of *Partula* from some of these islands, a remarkable fact in view of their low character and peculiar geological formation. Moki, however, had not been visited before. At both Moki and Mangaia, I found a species of *Partula* living in banana, orange and screw-pine (pandanus) groves of the coral plateau.

My voyage was then continued to New Zealand, which does not possess any species of *Partula*; but it is a region of great interest geologically on account of its volcanoes and geysers, and also in ethno-



VITI-LEVU. THE LARGEST OF THE FIJI ISLANDS

A characteristic jungle scene

logical respects because its natives, the Maoris, are the offspring of the same stock which peopled the Society, Cook, Samoan, Hawaiian and certain other groups of Polynesia. My route then proceeded through the Tonga group, which includes many beautiful examples of all three kinds of South Pacific islands. At the end of September headquarters were established in Apia, the main town of Upolu in the Samoan group, and explorations were made in this and neighboring islands. Peculiar species of *Partula* live here, and they, like the Society Island forms, are

restricted to particular islands. The climatic and other conditions were so adverse that a complete exploration was impossible in Samoa at this time of the year. In Tutuila, however, which is the largest island of American Samoa, a practically complete survey was made, and much interesting material was secured. The high mountain slopes covered with dense vegetation are pictured on page 129. They are like those of the Society Islands, but the intervening valleys are not as rigidly isolated as in the latter region, so that the species of different parts of the islands resemble one another quite closely. Our interest here centers in the comparison of Samoan species with those of other groups.

The Fiji Islands, next in order, belong ethnologically and geologically to Melanesia, a quite distinct region of the South Pacific. Ovalau and Viti-Levu were visited, but no species of *Partula* were found in them; the single form from this group that is known to science occurs in more remote islands. It seems strange to one familiar with southeastern Polynesia that the *Partulas* should be lacking, for the thick, moist jungle (page 130) and the topography seem to be in every way the same as in the eastern islands. Going next to the Hawaiian Islands, I spent considerable time in studying the famous collections in the Bishop Museum which were made by Andrew Garrett during decades of research in the islands of the Pacific. Most of the original forms had been discovered during Garrett's explorations, and so his collections with his own identifications must always have great value for the student of the present day. Through the kindness and courtesy of Dr. C. M. Cooke of the Bishop Museum, excursions were made into the field in the island of Oahu, in order to observe personally how the *Achatinellid* land-snails resemble and differ from the *Partulas* in biological relations. The remarkable fact resulting from this comparison is that the former snails are restricted to isolated trees or clumps of trees on the sides of the valleys, while the drier and more open valley-bottom forms the barriers, instead of the ridges as in the case of the *Partulas*. The essential principles of distribution, however, are the same.

The zoölogist who travels more or less extensively in the South Seas soon becomes an ardent student of the native inhabitants. His interests would be aroused by the primitive daily occupations and culture of the people who, nevertheless, have developed remarkable intellectual powers; but the feature of greater significance to the investigator of the principles of geographical distribution is the fact that precisely similar phenomena

are displayed by the various Polynesian island-races and lower forms like the snails already described. The Polynesians from the Paumotus westward to Tonga and New Zealand and from Hawaii southward to the Austral Islands possess the same general physical and intellectual characteristics, while their culture is practically uniform throughout this vast region. These resemblances indicate a common ancestry of the several races, and the native traditions confirm the conclusion which may be based solely upon observations of the present day. The islanders of each group have certain more or less unique qualities, especially in the matter of language. Subservient, like other living things to the control of evolution, the natives as well as the snails have come to differ more or less widely in correlation with their greater or lesser isolation in geographical regions.

HENRY E. CRAMPTON.

ANTHROPOLOGICAL WORK IN THE SOUTHWEST

DURING the past few months the Museum has been carrying on important anthropological work in the Southwest through Dr. Pliny E. Goddard and Dr. H. J. Spinden of the Department of Anthropology. A glimpse at what is being accomplished is given in a recent report from Curator Clark Wissler, who has been making a tour of inspection. Extracts from Dr. Wissler's report are as follows:

SANTA FÉ, NEW MEXICO,
March 30, 1910.

* * * * I am able to make a brief report on our work in the Southwest. In general, I find the results in collections beyond what I dared hope at the outset, while in the research side of the work my expectations have almost become realities. As you will recall, we planned work on a programme that would this year give us fair collections from the pueblo and non-pueblo dwelling Indians of New Mexico and Arizona, excepting the Zuñi and some divisions of the Yuma stock. To date we have collections from the four divisions of Apache peoples, two divisions of the Pima stock and the various Rio Grande Pueblo. Collecting among the Navajo is now under way, and I expect to try some of the Yuma groups soon. Thus, we shall have brought together in less than a year's time, from actual field-work, collections representing six tribal divisions and as many villages of Pueblo

Indians, as a whole constituting two general types of culture, occupying an area comprising the territories of New Mexico and Arizona. * * * *

From the research point of view our important pieces of work are on the Apache and the Rio Grande Pueblo. The former resolve themselves into several groups each of which has a culture modified largely by environment and contact with their neighbors, the determination of these sub-types and their origins being the important problem. While the Apache hold a prominent place in the general literature of the South-west, their culture has not hitherto been made the subject of systematic investigation by anthropologists. * * * * The Rio Grande Pueblo constitute by far the largest body of their class, but they have not been systematically studied in contrast with the Zuñi and Hopi groups. While our collection is far from representative of the villages taken severally, as a whole it covers their general culture fairly well and contains some very good things. There are pieces of pottery made fifty years ago which in connection with that of recent make certainly give us the modern type, making our collection a standard. In several other classes of objects we fare almost as well.

STEFÁNSSON-ANDERSON ARCTIC EXPEDITION

SINCE the last issue of the JOURNAL more extensive reports than we have had heretofore have come in from Dr. Rudolph M. Anderson, the biologist of the Museum's expedition to the Arctic coast of North America east and west of the mouths of the Mackenzie River. For many months nothing was heard from him, but no news was considered to be good news, for bad news travels rapidly among the Eskimo, and no anxiety was felt regarding his welfare. Letters from both Mr. Stefánsson and Dr. Anderson were published in the April number of the JOURNAL, and we now have the privilege of publishing extracts from the narrative of the latter's experiences during the preceding months. He writes as follows:

HERSCHEL ISLAND, August 22, 1909.

* * * * Mr. Stefánsson and I left Flaxman Island October 20, 1908, going in opposite directions. I started east with one sled and eight dogs, four Eskimo, our employee Ilavinerk, his wife Mamayouk, their little girl, and an 18 year old boy named Kiðya. The latter had no place to stay for the winter and wished to accompany us as a "volunteer." He proved to be

a good sheep hunter and a useful companion. We followed the coast line, in general, to the mouth of the Hula-hula River, about six miles west of Barter Island. Here we picked up a toboggan, very useful in the mountains, and fixed up our whaleboat cache. We took only three 50 lb. sacks of flour, two slabs of bacon, a few pounds of beans, and some tea and tobacco with us from Flaxman Island. We cached half a sack of flour here for our return trip, but it was eaten by wandering natives before we returned. There is plenty of driftwood along the coast for camping purposes, but inland, between the coast and the mountains, there is little to burn, only a few willow twigs and snags along the river bars. We found two families of natives living on the Hula-hula, and hunted with them during November, the entire party killing fifteen sheep (*Ovis dalli*). One mountain hunter, named Kunagnana, with his wife and three small children had been living on sheep for months. He had over thirty sheepskins on hand, besides having clad the whole family from head to foot in sheepskins. His shirt, coat, pants, stockings, boots, mittens, snow-shoe lacings, and even the little tent he lived in, were made entirely of mountain sheepskins.

Our flour and other "civilized rations," except tea and tobacco, were gone early in November, and for the next month we lived on mountain sheep "straight," with a few messes of ptarmigan thrown in. Willow ptarmigan were very common and rock ptarmigan rare in the creek valleys. On the north side of the mountains, it required very little effort to bag ten or fifteen ptarmigan in a couple of hours. Later in November, we joined forces with a party of five Eskimo whom we had met at Herschel Island the summer before — Auktelek and his wife Tulak, their grown son Akorak, and another young hunter named Pikalo, and the latter's father Kunasilek. Auktelek told me that several years before his brother Umegluk with two companions had crossed the "divide" from the head of the Hula-hula River and hunted on a river flowing south (I believe the middle or east branch of the Chandlar), a northern tributary of the Yukon, and had found plenty of tük-tü (caribou). There is an immense territory south of the Endicott Mountains and north of the Yukon which the white prospectors have not yet reached except in a few places. The Rampart House and Fort Yukon Indians do not range so far north except in summer, and the Eskimo seldom cross the mountains. To the knowledge of the natives, no white man had ever crossed the mountains in this region.

We decided to cross this mountainous divide. We hauled a load of meat and a little wood within a quarter mile of the summit and camped one night (December 3) above the willow line. We took the sleds over safely by putting ten dogs in harness, and with the help of six men boosting and pulling. Descending a rocky creek gorge, we reached large willows before night of

December 4. The second day devoted to hunting brought in one sheep out of a flock of eleven seen. The third day's travel brought us to green spruce trees. Ptarmigan were scarce, also hard to find as the river valley was wild. We were on pretty short rations before we struck the caribou herds in the high foothills on December 18. The snow was deep and soft on the south side of the divide, our sleds were soon stalled, and we were delayed for days cutting trees, hewing out boards and making toboggans. A trail had to be snow-shoed ahead, and travel was slow, all hands "slugging" in harness with the dogs. Two porcupine and a great gray owl proved welcome additions to our larder. Canada jays were observed a few miles north of the limit spruce trees, and ravens were often in sight. During the latter part of December we saw many caribou, at one time over a thousand within rifle range at one time,—a magnificent spectacle. We lived in tents until December 23, when we built a hut of poles covered with blocks of moss, living there until late in January, occasionally seeing caribou. They were continually moving eastward, and we were finally compelled to cross a low chain of hills to another large creek valley about twenty miles farther east. When we were down to our last day's food, we fortunately killed sixteen caribou, January 31, and one moose, February 4. This gave us meat enough to attempt the return journey. * * * * The return journey was easier than the descent, as the river was covered with ice. We often had difficulty in crossing places where the whole river half a mile wide was overflowed with several inches of water which perhaps had a very thin crust of ice over it—this at -50° Fahrenheit. Lowest temperature observed was -54° F. We recrossed the "divide" February 28 and reached Flaxman Island March 7, having been on a "straight meat" ration for four months,—two months without salt. All the party, however, were in fine health and condition. * * * * The usual procedure before moving camp is to pound up every bone and boil the fragments to extract the grease—as a result of which few bones are left on the mountains for future palæontologists to ponder over.

I made another trip to the Hula-hula River from Flaxman Island to bring out the balance of my skins and skulls, returning April 14, and met Mr. Stefánsson, whom I had not seen since October 20. After finishing the preparation of my specimens I started west from Flaxman Island, and sledged as far as Smith Bay. Here I found a note from Mr. Stefánsson who had preceded me, stating that advices had been received at Point Barrow to the effect that no whalers were coming into the Arctic Ocean this summer, and we were left to our own resources to get our belongings east.

We at once started hauling goods and supplies east from our cache at Smith Bay, and by strenuous effort with two sleds succeeded in getting five

sled loads of gear, and a thirty-three-and-one-half foot skin "umiak" within a few miles of the Colville delta before water overflowing the sea ice put an end to sled travel on June 14. Launched this boat on June 23 and have spent the time since then moving eastward, paddling, sailing or tracking. I have spent all available time in collecting, and have taken a fair series of eggs and nests, including whistling swan, black brant, black-billed and American golden plovers, turnstone sp., red-backed pectoral, Hutchins goose and semipalmated sandpipers, northern and red phalarope, snowflake, Lapland longspur, parasitic jaeger, red-throated loon, willow ptarmigan and others, all from the vicinity of Colville delta. * * * * Near Flaxman Island, we found several Herschel Island boats at the trading rendezvous to meet the Cape Smythe traders, and Ningakshuk, owner of a small sloop, kindly brought me, with several dogs and several hundred pounds of specimens, as far as Herschel Island. * * * *

CAMP NEAR TOKER POINT,
Arctic Coast, October 16, 1909.

* * * * Since my last letter, dated Herschel Island, we have progressed thus far eastward. My party sailed from Herschel Island at 3:30 A. M., August 25, with two whaleboats and one sloop — one boat belonging to us, the other to a young native named Pikalo, who, with his father, had agreed to come with our party and assist us, on consideration of being free to trap on his own account during the winter. The sloop belonged to Ningakshuk, who wished to go some distance eastward, as an independent venture. He aided us materially by carrying seven dogs and several hundred pounds of baggage through the Mackenzie delta.

We were often delayed by bad weather and head winds. It was necessary to stop for several days east of Shingle Point, as it is unsafe to cross the shoals on the western side of the delta, unless the wind is light and fairly S. W. Just east of Tent Island we were stopped again by head winds and foggy weather; then we cruised through a network of channels south of Langley Island, and after several days of tedious tacking and grounding, reached the mainland opposite the south end of Richard Island (Tūnūñōk). At this point, our friend Ningakshuk decided that he dare not risk his sloop outside of the river, fearing heavy September gales in the shoal water outside.

We were consequently compelled to transfer our baggage from the sloop to the two whaleboats. This loaded them down heavily, without the seven people and eleven dogs which we were carrying. The channel east of Richard Island is very wide, but is shoal in many places, and a N. or N. E. wind raises a rough sea quickly. Entered the harbor at Kittigarynit September 26. Several Eskimo families were camped here, and were revelling

n abundance of fish, and "killalua" (white whale or beluga) meat and blubber. The natives are said to have killed about two hundred beluga near here during the summer, and every family has large caches of meat and plenty of oil — enough for the winter. * * * * This region has evidently supported a comparatively dense population in the past, as the beach is lined with old houses and every hill-top is strewn with graves.

On September 22, we reached a harbor in a little lagoon, known as Tūtōroktok, a few miles S. W. of Toker Point, just as a N. W. gale began to blow. The storm lasted three days, and on the morning of the 26th "young ice" had formed half way across the lagoon, while a heavy snow-fall had filled the sea with slush ice. With some difficulty, we moved the boats out to another and better harbor about half a mile away, and as there was no prospect of advancing farther by boat, we hauled the boats up on dry land for the winter.

As long as there was any open water, we caught fair hauls of fish in our nets every night, and after that have had fair success fishing through the ice. We have been getting our dogs into good condition for a long sled trip and have now all the frozen fish we can carry, as well as a cache of about 200 lbs. to leave here for the coming spring.

We are starting to-day with three sleds for the eastward to join Stefánsson, expecting to find him somewhere between Baillie Island and Cape Parry. Sled travel is not good even now. There has been no very cold weather, and the sea ice is not solid. The bays froze over earlier than usual at such temperatures, as the water was clogged by falling snow. Heavy snow-falls later prevented the ice from getting thick, and the salt ice is still wet and slushy under deep snow. Our intention is to follow the coast a little farther east than Warren Point, make a portage of "our sloop" across to the Eskimo Lakes, follow the lakes northeastward, then portage again, to strike the foot of Liverpool Bay, near Nicholson Island. From Nicholson Island we shall follow the east side of Liverpool Bay to Baillie Island. If Mr. Stefánsson is not at Baillie Island to make other arrangements, we shall proceed down the west coast of Franklin Bay around to Cape Parry and as much farther as circumstances will permit during the winter. * * * * The prospects are favorable for a successful season.

MUSEUM NEWS NOTES

EARLY in April, President Osborn returned from a journey in Arizona, Mexico and California partly in the interests of the Museum. Two of the great copper mines of Arizona and Mexico were visited, and with the aid of Dr. James Douglas, one of our Trustees, questions relating to the future exhibition of the geology and economics of copper were studied. In California, arrangements were made with the Mt. Wilson Observatory through Director George Ellery Hale to secure for the Museum copies of the most recent solar photographs. Dr. Hale has also consented to take the chairmanship of an appointive committee on astronomy. A visit to the palæontological collections of the University of California led to concluding important arrangements for future collecting on the Pacific coast with the cordially promised coöperation of Prof. J. C. Merriam of the University. An interesting trip was made to the famous bone beds of the Rancho La Brea.

THROUGH the generosity of Mr. Anson W. Hard, the Museum is fortunate in having secured an extensive series of old and valuable serapes and other blankets made by the Saltillo and other Indian tribes of Mexico and several of the tribes of our own Southwest.

SINCE our last issue the following persons have been elected to membership in the Museum: Sustaining Members, MESSRS. JOHN G. MILBURN and D. SCHNAKENBERG; Annual Members, MESSRS. PAUL B. HAVILAND, COLIN I. MACDONALD, WINTHROP PARKER and Warburton Pike, DR. ALEXANDER LAMBERT, HON. FRANCIS M. SCOTT, MRS. J. B. DUER and Miss MABEL SATTERLEE.

MR. FRANK M. CHAPMAN writes that the party collecting material for the zonal group representing the fauna and flora of the eastern edge of the Mexican plateau is in good health and is rapidly attaining its objects. Mr. Chapman and Mr. Fuertes have made their studies from near Cordova to a point above timber line on Mount Orizaba, and the former's letter is, in part, as follows:

"Cordoba, 28 March, 1910.

"We got back from our mountain trip last night. The first two days on the mountain we had constant fog or rain, then it cleared and the weather was superb. We camped at 8,500, 9,500, 10,500 and 12,000 feet. At the highest camp the mercury fell to 12° F. The mountain has never been ascended from the side we were on and is said to be there unscalable. It looked so! I went only to timber line at 13,000 feet and then found permanent ice 100 feet higher. Here life ceased and further ascent would have served no purpose that I had in view, had it been possible.

"The temperate zone has been materially changed by man, and there is no first growth left, even in this unfrequented part of Mexico. The limit of human habitation is approximately marked by the limit of corn growing, or about 9,000 feet. Here we found magnificent forests of pine and spruce, with oaks six feet in diameter and over 100 feet high. Timber line is marked by the abrupt cessation of tree-growth, the last trees being 30 to 40 feet in height. We got an essentially complete list of Alpine birds and other data of value, including a large series of photographs."

MR. ROY C. ANDREWS, of the Department of Mammalogy, is visiting the whaling stations of southern Japan, where the opportunities for the study of several species of cetaceans are particularly good.

DR. LOUIS LIVINGSTON SEAMAN delivered a lecture at the Museum on Thursday evening, April 7, 1910, entitled "African Explorations and Adventures." Dr. Seaman has visited Africa on several occasions. His lecture was illustrated by stereopticon views of the territory of Uganda, the shores of Albert Nyanza and other regions, and he dealt particularly with his studies upon the tsetse-fly and sleeping sickness and incidentally with the ethnological and geographical features of his expeditions.

ON Friday, April 15, from four till six and from eight till ten o'clock, there was held a private exhibition of the collection of African game made in 1909 by Messrs. E. Hubert Litchfield, Bayard Dominick, Jr., and Henry Sampson, Jr. The collection includes more than three hundred heads and illustrates admirably the range of variation in size and color of the animals that have made East Africa famous. During the afternoon and evening a large series of photographs illustrating the capture

of the animals, the physical aspect of the country through which the expedition passed and the primitive inhabitants, was thrown upon the stereopticon screen. The newly arranged African Hall is now open to the public.

THE collection of meteorites in the Foyer has been enriched by the recently acquired siderite or iron meteorite to be known as Knowles, the name of the post office in Oklahoma nearest to where it was found. The find has not yet been described, but a full account with illustrations will soon be published. The mass weighs about 355 pounds. There has also been placed on exhibition here the second largest known mass of the siderolite form of the Brenham (Kansas) meteorite. This weighs 218 pounds and replaces the two smaller masses of the same fall that have heretofore been on exhibition.

Monday, May 16, 8:15 P. M.

In coöperation with the

NEW YORK ACADEMY OF SCIENCES

In the large Auditorium of the Museum

Illustrated Lecture

“The Return of Halley’s Comet”

By

PROFESSOR S. A. MITCHELL

Of Columbia University

No tickets required

Members of the Museum and their friends are cordially invited to attend

MEETINGS OF SOCIETIES

Public meetings of the New York Academy of Sciences and its Affiliated Societies are held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

- First Mondays, Section of Geology and Mineralogy;
- Second Mondays, Section of Biology;
- Third Mondays, Section of Astronomy, Physics and Chemistry;
- Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

- The Linnæan Society of New York;
- The New York Entomological Society;
- The Torrey Botanical Club.

On Wednesdays, as announced:

- The Horticultural Society of New York;
- The New York Mineralogical Club.

On Friday evenings, as announced:

- The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

EDMUND OTIS HOVEY, *Editor*.
MARY CYNTHIA DICKERSON, *Associate Editor*.

FRANK M. CHAPMAN,
LOUIS P. GRATACAP,
WILLIAM K. GREGORY, } *Advisory Board*.

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(Issued as supplements to The American Museum Journal)

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MOBALI WOMAN CARRYING WATER

The Congo natives (Bantus) are sharply cut off from the other five African races by their language, which, soft, flexible, built on a systematic, philosophical basis, would seem to argue degradation from some superior race

The American Museum Journal

VOL. X

OCTOBER, 1910

No. 6

IN THE HEART OF AFRICA

THE FIRST PUBLISHED ACCOUNT OF THE MUSEUM'S CONGO EXPEDITION

Photographs by Herbert Lang

TWO members of the Museum staff, Messrs. Herbert Lang and James Chapin, are in the Upper Congo region, that great steaming land of equatorial Africa shrouded in jungle. They have slowly sailed up the Congo River, one of the three largest rivers of the world, and least well-known; they have travelled on foot through dense tropical forests proceeding for hours through swamps until, as described by one of them, they were dripping and picturesque like the mighty jungle trees with innumerable hangings and decorations. They have seen strange places and stranger primitive peoples, of whom it is time that the world obtain complete scientific record in view of the rapid advance that civilization must make in the Congo in the immediate future. The photographs that they have sent tell a small part of the story of their progress into this heart of Africa, giving, however, a realization of the inadequacy of cold gray pictures to make vivid a tropical country, the splendid color, the sounds, the life — and the heat. It was in regard to the last that Mr. Lang wrote the following advice to a friend: "While looking at the pictures get into a Turkish bath. You will appreciate the country better."

The Congo is probably one of the most promising unexplored fields for zoölogical work in the world. There has been every reason to prevent investigation of the region previously. Civilization has ignored the west coast of Africa. The world knows the north, east and south coasts, but mystery has been attached to the whole six thousand miles of the coast on the west where surf continually thunders.

The Congo, inland, is cut off from communication with the north by the desert of Sahara, from the east and the valley of the Nile by high mountain ranges, from the south by trackless jungle and misty swamp. It lies in the heat of the equator, inaccessible and inhospitable, a country of nearly one million square miles, larger than Europe leaving out



EMERGING FROM THE FOREST NEAR AVAKUBI

In Central Africa, more than 8000 miles from New York. A caravan of more than 200 people was necessary to transport the expedition's equipment from Stanleyville to Avakubi

There are great difficulties in photographic work at the Congo camp, partly because of the intense heat; developing is done at night



MR. HERBERT LANG LEADER OF THE
CONGO EXPEDITION

Mr. Lang, an expert in zoölogical survey and modern taxidermy, has had previous experience in Africa, having gone in from Mombasa on the East Coast in 1906

four centuries after the discovery of the river was it charted, that is, by Stanley in 1877.

Latterly, conditions have wholly changed. There is now a lure for all nations in ivory, gold and rubber. The Arabs have been driven away and the slave trade abolished. Where formerly there was no way of transferring objects from

Spain and Russia. It has been given over to fever and sleeping sickness, to raiding Arabs, and to various negro tribes victims of slavery, and more or less cannibalistic in habit. It has neither sent out invitation nor given cordial greeting to the white man, who up to 1871 had not been more than one hundred and fifty miles from the coast. At that time no one knew whether the head waters of the Congo belonged to the Niger or to the Congo. Not till

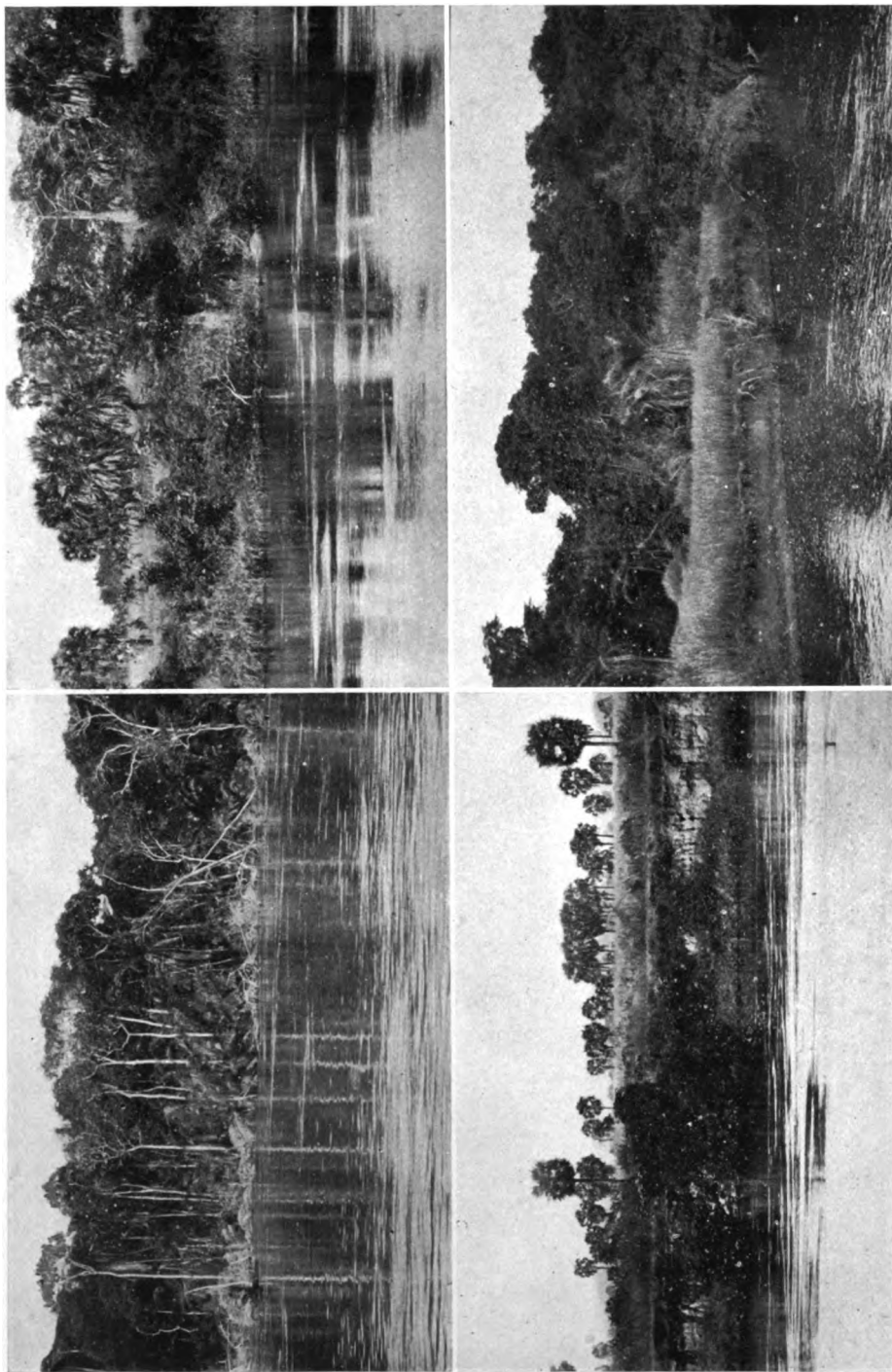


MR. JAMES CHAPIN, ASSISTANT ;

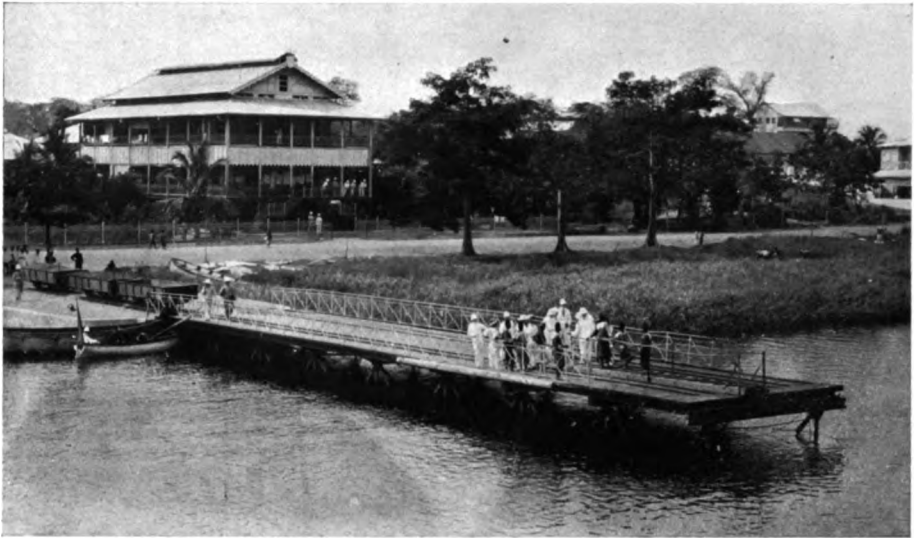
the coast except on the heads of negroes, now ocean steamers discharge cargoes at a railway pier one hundred miles up the river, a railroad continues to Leopoldville, 320 miles from the coast, connecting there with steamers for points still farther inland.

The Congo River between the coast, or more properly between Boma, one hundred miles from the coast, and Leopoldville, is a cataract region, a stretch of two hundred miles through which there is a rise of land from 700 feet above sea level to 2500 feet; or considering it in the other direction, down the river instead of up, there is a drop of 1800 feet through which the vast volume of water passes in a series of plunges from Leopoldville to Boma. It is this impassable cataract region that kept secret for so long the great highway of the Congo. Pass these two hundred miles and the Upper Congo stretches on through 1100 miles of smooth river, making with its tributaries one of the greatest systems of natural canals on the globe.

For many years, the late President Jesup held the hope that an expedition from the American Museum might be sent to the Congo. Even early in 1907, preliminary plans had been discussed with the Honorable Mr. Liebrechts, Secretary General of the Department of the Interior of the Congo, the negotiations being carried on through the Honorable James Gustavus Whiteley of Baltimore, *Consulat Général de L'État du Congo*, and the Honorable Pierre Mali of New York, Belgian Consul and an intimate personal friend of President Jesup. In May, 1907, the plans were so far advanced that Hermon Carey Bumpus, Director of the Museum, went to Brussels to confer with the Belgian officials. As a result of these negotiations the patronage of King Leopold was obtained for the project, a patronage which he evidenced at once by presenting large collections of ethnological material, a nucleus for the Museum's African halls. With Director Bumpus, the hope for an expedition to the Congo became one of the most cherished among his many plans for the rapid advancement of the institution along lines coördinate with the world's progress. His interest, with that of Mr. Whiteley, accrued also by that of Mr. John B. Trevor of the Executive Committee of the Board of Trustees, finally crystallized in a Congo Expedition Committee appointed late in the fall of 1908 by Henry Fairfield Osborn, President of the Board of Trustees, and consisting of these three men, Mr. Trevor acting as chairman, and of Messrs. Robert W. Goelet, Herbert L. Bridgman and Frank M. Chapman as added



SHORES OF THE LOWER CONGO PHOTOGRAPHED FROM THE STEAMSHIP LEOPOLDVILLE



PIER AT BOMA

The Congo Expedition reached Boma, Capital of the Congo Free State, June 23, 1909



WOODPOST AT BARUMBU

The river boats burn wood, stopping frequently for a supply at "woodposts," usually mere clearings cut out of the jungle

associates. The organization of this committee gave definite form and impetus to the negotiations which finally brought about the sanction of the authorities in Belgium to the Museum's exploration of the Congo, and which so controlled circumstance at home that the project dreamed of became a reality.

The history of the following months, in fact, till May 8, 1909, when Messrs. Lang and Chapin sailed on the "Zeeland" of the Red Star Line for Antwerp, is a fascinating chapter of work preparatory to the launching of a great expedition.

The matter of financing the expedition was taken in hand by a group of the Museum's members and friends, to whom the institution is deeply indebted and to whom the world in the future will be indebted because of the large scientific value of the expedition. They are Messrs. John B. Trevor, Charles Lanier, Cleveland H. Dodge, J. P. Morgan, Jr., William K. Vanderbilt, A. D. Juilliard, Robert W. Goellet and William Rockefeller.

Plans were outlined for the scientific end of the work: to push at once into the central part of Africa so that headquarters might be located eight hundred or more miles from the coast in a region formerly unexplored zoologically; to make the aim of the expedition a zoological survey of the basin of the Congo, collecting heavy game but also directing energies along other lines of investigation, so as to make collections for all departments of the Museum. While awaiting the final arrangements with the Belgian government, coöperation and enthusiasm among those concerned pushed the undertaking to a wonderful success in its preliminary stages, assuring an aim and scope to rank the expedition as perhaps the greatest the Museum ever sent out.



MOBALI WOMAN CARRYING FIREWOOD

Finally there came a day of good news, April 2, 1909, marked by the receipt of letters from His Excellency Baron Moncheur of the Legation de Belgique at Washington and from the Honorable Mr. Whiteley at Baltimore announcing that there had been secured not only the support and necessary good will of the Belgian Government but also an appropriation of 6800 francs (\$1329.23) toward the expense of transportation in the Congo. The compact agreed upon provided that in return the expedition should give to the Tervueren Museum, Belgium, certain suggested zoölogical specimens lacking there. The coöperation is expressed by the following words quoted from the reply of Director Bumpus to Baron Moncheur: "The American Museum of Natural History will consider it a privilege to be permitted to share the scientific results of this expedition to the Congo with the Musée du Congo in Belgium. We are confident that the combined efforts of the Colonial Administration of the Kingdom of Belgium and the American Museum of Natural History will result in the general promotion of Science and thus redound to the benefit of all people."

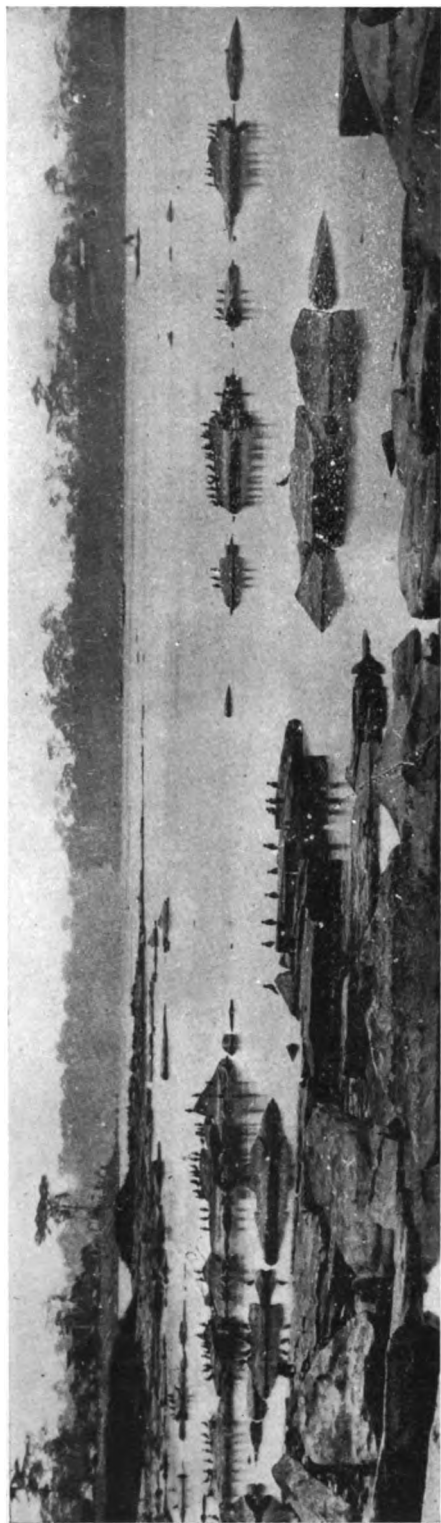
Practical work could now be pushed rapidly. Passports were obtained from the Secretary of State at Washington, steamship tickets were purchased, permits for freight obtained, money cabled to the Banque du Congo, Belge, Brussels, to be held at the disposal of the expedition. Through the courtesy of Mr. H. L. Bridgman, a member of the Congo Committee, letters of introduction were obtained to persons in Brussels, in particular to His Excellency, the Honorable Mr. Lane Wilson of the United States Embassy; and in each case the new allies proved their personal interest by writing to officials in the

Congo. On April 16, at a dinner given by President Osborn to the Congo Committee and other friends of the undertaking, a farewell was extended to the explorers and the last word was said in anticipation of unprecedented success for the work.

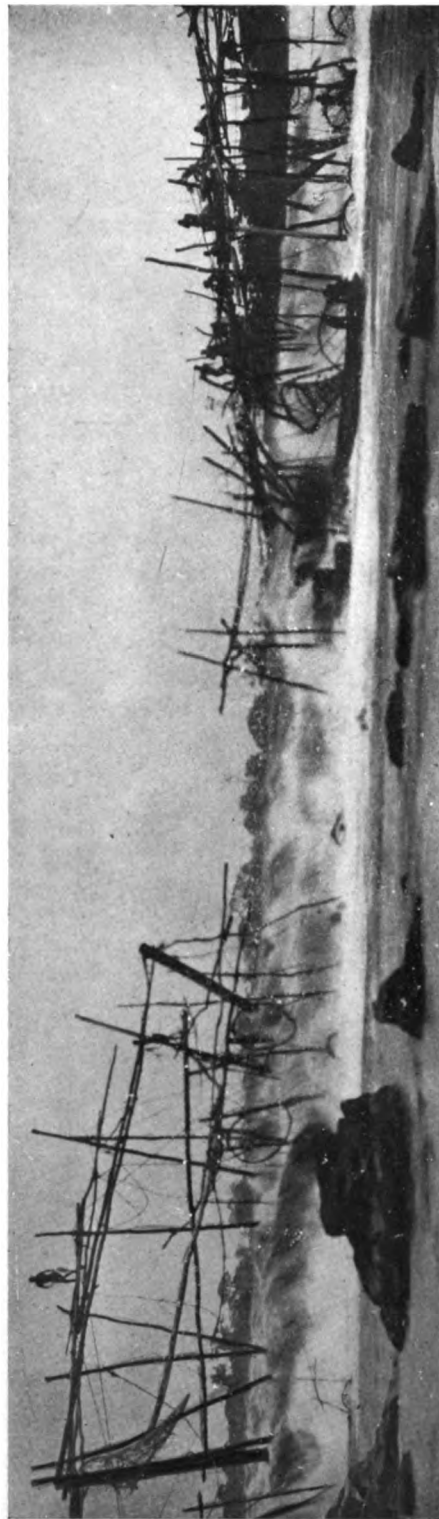
Thus the expedition



A RIVER BOAT ON THE WAY TO STANLEYVILLE



In August great flocks of plover-like birds, *Glareola*, sit on the sand bars and stone ledges of the Upper Congo



Arrangements have been made with the natives so that the expedition, on its return, will camp at the famous fisheries at Stanleyville till adequate fish collections can be made

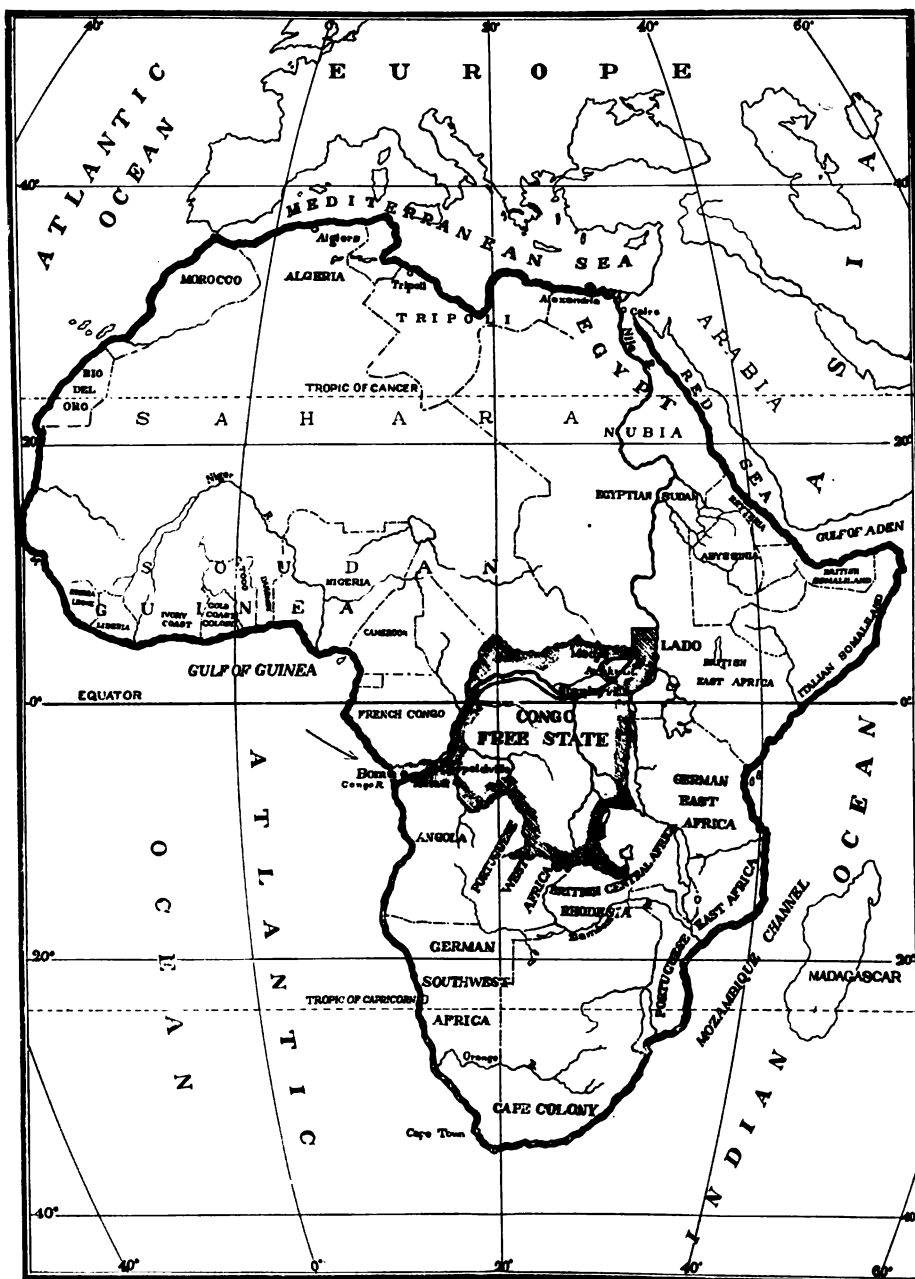
was launched. Messrs. Lang and Chapin reached Antwerp and proceeding to Brussels were cordially received. A letter from the Honorable Mr. Lane Wilson to His Royal Highness Prince Albert de Ligne brought invaluable services in securing concessions for the expedition: all articles for scientific purposes, except rifles, to be duty free; the collecting to extend not only to all ordinary specimens throughout the year, but also to the rare white rhinoceros of the Lado district, the elephant in Ituri, the white gorilla recently found in the Kivu region, and the okapi, that recently discovered relative of the giraffe.

In Brussels and London the equipment was completed, an equipment which throughout was based upon such sound considerations that the expedition is having unusual strength in the field. Special consideration was given to the medicine chest and to the tents. Through the courtesy of the Secretary General, Mr. H. Droogmans, it was most fortunate that the Chief of the Medical Service was met, Dr. Emile Van Campenhout. With ten years experience in the Upper Congo and many years of investigation of Congo diseases, especially of the sleeping sickness, he could advise preëminently well. He inspected the expedition's tents and pronounced them ideal for the region, recommending for night the partly closed rather than the all-round open tent used by the British in tropical work — for daytime use, however, recommending the all-round ventilating type.

Finally in the first week of June the start was made for Africa on the steamship Leopoldville and after twenty days' sail Boma was reached, one hundred miles from the coast, the capital of the Congo Free State for the past twenty-eight years. Here a warm greeting was received from the Honorable Mr. Handley, the American Consul General.

It was well that the expedition had planned to push immediately inland, because of the extravagant prices as well as the dearth of life in the region of Boma and Matadi, the latter a town built on ledges of rock a few miles above Boma. Mr. Lang writes:

You should see the relative poverty of the fauna around Boma and Matadi. This of course goes hand in hand with the general monotony of the country, nothing but hills, one as barren as the other, though occasionally the grass, usually four or five feet high, is replaced in the valleys by a few bushes. The scarcity of bird life is most striking as one enters the Congo River from the sea. The stream is seven miles wide at its mouth, with low shores, reeds, sedges, papyrus, mangroves and, in some places, cocoanut palms. Farther up, false *Borassus* [palms] and Baobabs become more abundant; yet there are few birds except of the very common kinds, some terns, swallows and a few vultures.



ITINERARY OF THE CONGO EXPEDITION

Sailing from Brussels on the steamship Leopoldville, the expedition reached Boma June 23, 1909, proceeded from Matadi by rail to Leopoldville, up the Congo by river boat to Stanleyville, from there through the "dense forest" on foot to Avakubi. The latest report, June 30, 1910, came from Medje

The expedition left Matadi by rail reaching Leopoldville July 1, beyond the cataracts and 320 miles from the coast. From there it proceeded by boat to Stanleyville, hoping to find this place suitable for a permanent base of operations. Stanleyville is 720 miles inland, twenty-two days' journey from Leopoldville, although the return trip requires only thirteen or fourteen days owing to the swiftness of the current. Most of the steamers on the Congo are stern-wheelers, of very shallow draught because there are so many sand bars. The expedition, however, did not utilize one of these steamers but took a barge, propelled by a twin screw tug alongside. Wherever the boat stopped to take on firewood, the men went ashore, collected whatever was possible, and on coming back had the advantage of the large deck of the barge for work.

Of the voyage up stream Mr. Lang writes:

The lack of any congregation of large birds must be a surprise to anyone, especially on such a mighty stream interrupted by so many forested or grass-covered islands. One kind of vulture is the most common large bird, but to see more than twenty in a day is unusual. There are some white-headed eagles. In Stanley Pool kites are common, sitting on the sand bars, in the neighborhood of which some solitary pelicans may be seen preening themselves or swimming. On shore there are ibis and geese. A few egrets emerge silently from the bushes on the swampy islands. Water turkeys, mostly single, but sometimes in pairs disappear at once in the water or reeds, or very often take wing to establish another lookout on some branch farther off. To see a few large herons is an occasion, but it may become an exciting event if one discovers, on some distant sand bar, a few marabous. Small shore birds or pigeons may often enliven the edge of shores and sand banks; but the only large aggregations of any bird on the Congo during this season are composed of a species of *Glareola*, of which several large flocks have been observed. Even the birds that cross the river from time to time show no great variety; flocks of screaming gray parrots are common in the morning and evening, a few hornbills in very elegant swoops, plantain eaters, single or in pairs, more seldom, ducks, heron and ibis. We distinguished five different kinds of kingfishers as they darted out from the branches or hovered over the water.

On land it is quite different. Above Kwamouth, not only are larger birds more common, but indeed small birds are fairly abundant, especially weaver birds, sun-birds, bee eaters, wagtails, sandpipers, goatsuckers, swifts, swallows, pigeons, rollers and starlings. We were disappointed in our desire to see mammals from the boat on the journey up stream. There were occasional bands of monkeys sitting in trees near the shore, but no elephants trespassing or bathing in herds, and no buffaloes. In fact, the few places where elephants have been seen six or more years back are pointed out to you, like historic places. Even the hippos seem to resent the bullets that are invariably sent in their direction by the passengers of any passing boat. It is true that we saw some, but it took good looking and a strong field glass. If it happens that a young innocent hippo shows himself full size on a sand bar, the ever hungry negroes on board talk only of something to eat and proceed to shoot him.



BARTERING WITH PASSENGERS ON THE RIVER BOAT

Congo natives are great traders, using for currency such objects as beads and brass rods



VILLAGE ON THE CONGO RIVER

The dots on the palm leaves are nests of the weaver birds. Flat and bare land shows where the river has eaten into and overflowed the shore



THE FALLS OF STANLEYVILLE IN THE DISTANCE

Showing the natives with their dugouts, and also the bar that stretches out into the river. It is at Stanley Falls that the famous native fisheries are located



AT THE ENTRANCE OF THE DENSE FOREST"

The mightiest primeval woods known to man. A cold gray picture is wholly inadequate to make vivid a tropical country, the splendid color, the sounds, the life — and the heat

Finding after all that Stanleyville was impossible as a base for operations, because of high prices and because too far distant from the most interesting zoological regions, decision was made to push on still farther east with a part of the supplies, to Avakubi in the Haut Ituri.

Certain bits of local color from Avakubi are in the following quotations from letters sent to friends and not intended for public reading:

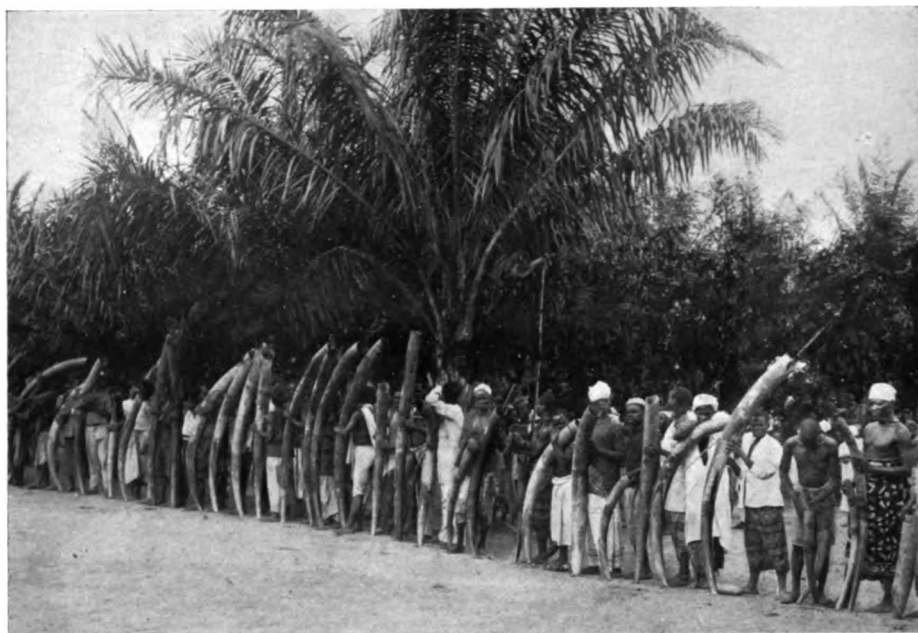
You laugh about the quinine, but I do not take quite ten grains a day. Every other day I take six grains and have become so accustomed to it that I do not notice any bad effects. Our medicine chest is quite a formidable affair, but seems to be mostly used for treating our black boys and porters, who are always having little illnesses, for which they want "dawa" (medicine).

Just now we are having the pleasure of inhabiting a house, built of bricks laid in mud, as they all are here, and roofed with palm leaves. . . . How you would laugh to see us catching bats in the evening with a butterfly net.

Avakubi is a great rubber station, about twenty tons a month being received from the natives as taxes. Some elephant tusks are also received from the same source. There is a mission here with two priests who often shoot birds for us. They have added a number of good specimens to our collection. It has taken us an almost incredible time to get out to this place, and will take almost as long to get back. Such an isolated spot can hardly exist anywhere else in the world. A lieutenant who gets his newspapers by way of East Africa, and consequently much more quickly than if they came up the Congo, has lately informed us that Cook claims to have discovered the North Pole. This is about the only news from the rest of the world we have heard. [November 12.]

That the place is isolated was well proved to the friends of the explorers when after August 14, 1909, the months passed by and no word came. Anxiety increased, notwithstanding the knowledge that the expedition had gone far into the Haut Ituri district where it was difficult to get out mail. In late April, however, a sixty-six page report dated November 29, relieved all fear. They were putting in every hour from the first beam of light in the morning till nightfall, and often till midnight when the work required it, and that in a humid atmosphere of about one hundred degrees, but heroically said that all was so fascinating they were not thinking of discomfort. The report, which was rather bulky, had come by parcel post and had been nearly five months on the way.

The comparative isolation of the Congo is well illustrated in the matter of cablegrams. For instance, a cablegram from New York to a point five hundred miles inland in British East Africa will be answered in about eighteen hours, while one from New York to Boma



IVORY CARAVAN

A caravan with 97 tusks from the Haut Ituri. The largest weighs 106 lbs. and is 9 ft. long. Trade in the Congo is now in the hands of several nationalities



"WIRELESS" STATION AT STANLEYVILLE

By an intricate system of beating the tom-tom — a log hollowed out through a narrow slit — news is "telegraphed" at night. The sounds repeated over and over carry six or seven miles

or Matadi only one hundred miles from the coast will not even reach its destination for from ten to fifteen days. In fact, the delay is said to be sometimes so great that a letter may be received before the cablegram.

The report of November 29 shows remarkable industry. It reveals work astonishing in amount and careful and systematic to a degree. Mr. Lang is evidently living up to his reputation for speed and skill in the work of zoölogical survey and expert taxidermy; and not only this, but also such system is being used in labelling the material that the collection will have in-



"TELEGRAPH" OPERATOR

Sounds produced by beating at different points on the tom-tom are combined into a syllabic alphabet, so that any message, however complicated, can be sent



NATIVES OF STANLEYVILLE PLAYING A GAME

They spin fruit stones like tops. The trick is to spin two on the banana leaf so that one will not bounce the other off

dubitable scientific value. It was the wish of the Museum that all specimens, large and small, should be individually tagged so that if at any time they had to be abandoned but did ultimately reach the Museum, there would be more chance of their scientific value having remained unimpaired. It scarcely seems possi-



A RESTHOUSE AT BAFWASIKULE

Erected for the agents of the colony. The courtesy of these resthouses has everywhere been granted to the expedition



MUSEUM CARAVAN CROSSING A RIVER

The raft is attached to lianas stretched across the stream

ble that two men in the short space of two months after reaching their base of operations should have been able to prepare such a list of specimens, 291 mammals and 472 birds, besides more than 2000 specimens of the smaller fauna. A later report sent out January 5, little more than three months after reaching Avakubi, shows a record of 510 mammals and 762 birds, with more than 4000 of the smaller fauna, and this collection covered by 400 pages of descriptive matter.

That so much has been done is due not only to speed and skill, but also to the foresight of the leaders in planning and to that force of personality which can get enthusiastic work from subordinates. Three assistants (Loangos, a tribe from the French Congo, known as very intelligent) were hired before leaving Leopoldville. These fellows were taught during the voyage up the river. Afterward, just before leaving Stanleyville, the last place where natives can be engaged by contract, fifteen assistants were hired — for a monthly payment of three dollars in addition to food.

We have done our utmost [writes Mr. Lang] in training these natives and look forward with great pleasure to the results. Six of them can prepare small mammals, four can prepare birds, several of them can do the work on larger mammals, though all of them can take active part in it. Besides, two are successful hunters, and all know how to set traps for small mammals and to catch reptiles and batrachians. Several are very keen in catching invertebrates, and one is remarkable for finding different species of ants. Others are fishermen; they know how to weave native fish traps and they handle canoes with skill. As a whole they are a remarkable lot of natives, and I sincerely hope that the results will show what can be achieved by native assistance.

In addition to these trained assistants the expedition has forty porters for the work of ordinary occasions. The porters are not hired for a long period but are paid and discharged at the end of every trip, fresh ones being engaged in each new locality through the assistance of government officials. The porters of the Upper Congo cannot carry as heavy loads as those of British East Africa; fifty-five pounds (English) is taken as a maximum load. This results not only from their inferior physical constitution, for there are many strong and well-built porters, but it is, of course, more weakening, even for natives, to carry loads in the hot moist atmosphere of the forest than on the generally healthy plains of British East Africa. A very large caravan was necessary for the travel through the dense forest from Stanleyville to Avakubi; one hundred and sixty porters were hired at Stanleyville and to get along

quickly and safely twenty more were engaged from village to village. It is interesting to know that after twenty-two days' march under all the difficulties of making way through a wet tropical forest, this large caravan was brought to a safe arrival at Avakubi, having lost neither man nor load and with everything of the equipment in perfect condition.

To read the following quoted from Stanley's description of the Congo jungle brings a fuller appreciation of this march:

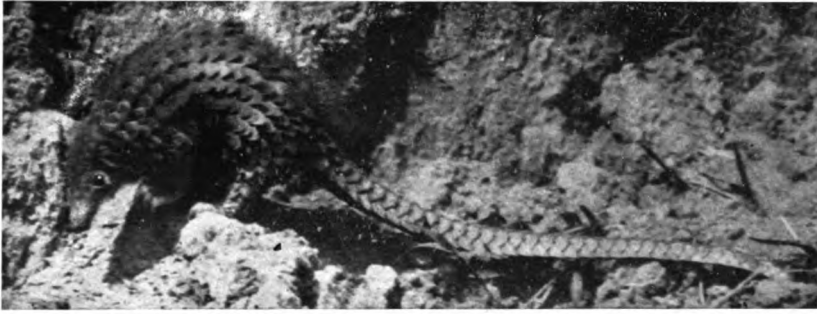
Lean but your hand on a tree, measure but your length on the ground, seat yourself on a fallen branch, and you will then understand what venom and activity breathe around you. Open your notebook, the page attracts a dozen butterflies, a honey-bee hovers over your hand; other forms of bees dash for your eyes; a wasp buzzes in your ear, a huge hornet menaces your face, an army of ants come march-

ing to your feet. Some are already crawling up, and will presently be digging their scissor-like mandibles into your neck Imagine the whole of France and the Iberian peninsula closely packed with trees whose crowns of foliage interlace and prevent any view of sky and sun Then from tree to tree run cables from two inches to fifteen inches in diameter, up and down in loops and festoons and W's and badly-formed M's; fold them round the trees in great tight coils, until they have run up the entire height, like endless anacondas; let them flower and leaf luxuriantly, and mix up above with the foliage of the trees to hide the sun, then from the highest branches let fall the ends of the cables reaching near to the ground by hundreds Work others through and through these as confusedly as possible on every horizontal branch plant cabbage-like lichens of the largest kind, and broad spear-leaved plants . . . and orchids and . . . a drapery of delicate ferns. Now cover tree, branch, twig, and creeper with a thick moss like a green fur To complete the mental picture of this ruthless



CHIEF OF A RENOWNED CANNIBAL TRIBE

The cap of leopard skin and red parrot feathers gives him wisdom; the chain of leopard canines confers the leopard's stealth and cunning. Instead of the ivory disk usually gracing the upper lip of the Congo native, he wears a polished leopard incisor



Congo anteater
or Pangolin

forest, the ground should be strewn thickly with half formed humus of rotting twigs, leaves, branches; every few yards there should be a prostrate giant . . . half veiled with masses of vines . . . and every mile or so there should be muddy streams, stagnant creeks, and shallow pools, green with duckweed, leaves of lotus and lilies, and a greasy green scum . . .

In addition to the government assistance in the matter of porters, which has been due largely to the personal influence of Mr. Jules Renkin, Minister of Colonies, courtesies have been extended to the expedition in two other directions. It has been granted storage free of charge in every magazine of the Province Orientale, and has been allowed to get goods from the government storehouses. This latter privilege is of unusual importance as no money of any kind is used among the natives of the Upper Congo and the various kinds of articles, brass rods and accordions, for instance, prized and accepted in trade among these tribes are so



Striped Squirrel
of the Congo



Congo
Horned Viper



REVISING THE LOADS. TWO HOURS FROM AVAKUBI

The 200 porters and native assistants of the Congo Expedition after marching through the dense forest for 22 days



CONGO EXPEDITION ENTERING AVAKUBI STATION

Congo natives cannot walk long distances, and admire greatly the white man of strength and endurance

unusual in a white man's eyes that no adequate preparation could be made.

When the report of January 5 was sent, the active work on heavy game had not commenced. The expedition was on the point of engaging experienced native hunters and the very keenest pygmies to be found. It was in the district of large game where the trumpeting of elephants could be heard from the camp, and elephants' trails — deep round footprints "as if someone for amusement had gone about sinking a bucket into the mud and pulling it out again" — were common along the river and in the banana plantations. For the most part heavy game in Central Africa is protected by law and is relatively abundant, not near extinction as in South Africa. The square-mouthed or so-called white rhinoceros, however, is not common anywhere in Africa. It is practically extinct in South Africa, is rare in the narrow strip of country west of the Nile — the Lado of Central Africa — and is wholly unknown in all other parts of the continent. The square-mouthed rhinoceros is on the average larger than the common African rhinoceros, has a double hump in the region of the neck and a head that differs wholly in shape from that of the common form, one striking point of difference being a square upper lip instead of a pointed overhanging one.

Also, the expedition was in the land of the okapi, with the hope of getting specimens for a group in the Museum. Less than ten years ago the world was stirred by the discovery of a new animal in the northern part of the Congo forest, *okapi*, the natives called it. Stanley had gained from the dwarfs some hint of it. He thought it related to the horse, in spite of the anomaly of a grass-eating animal living in forests. When actually seen, the okapi was found very wonderful: a shy animal, standing as high as a stag, and feeding on the leaves and twigs of trees,



MAMBUTI PYGMY, AVAKUBI

Congo pygmies, having the height of ten-year-old children, are shy, vindictive when angered, keen in hunting. Many photographs and 24 measurements of this pygmy have been taken, besides a plaster cast of his face

its sleek, glossy coat even brown above while zebra-like on the legs and posterior part of the body. Its foot has two hoofs but no vestige of the two small false hoofs characteristic of the deer. In fact, the okapi proves itself closely allied to a fossil animal, *Helladotherium*, of Greece and Asia Minor, its nearest living relative being the giraffe.

The hunting trips for large game will facilitate the work along anthropological lines since pygmies will be a part of the company. Besides, villages will be visited, having two or three hundred pygmies attached to them. Some successful casts have already been made of the faces of three pygmies, but dwarfs are so shy that they are reluctant to submit to the procedure. They were won over by having their hands cast first. After they had seen how simple a matter it is, they were induced to allow the plaster to be put on their faces.

A letter sent to friends in early January tells of the personal welfare and good cheer of the explorers:

On Christmas we dined especially well and on New Year's day opened a canned plum pudding (!) that had been given to us in Stanleyville. Good food is not at all scarce here. Yesterday we looked over our stock and found we had seven live chickens, ten pineapples, three large bunches of bananas and various fresh vegetables and fruits. Sweet potatoes, whiter and not so tasty as those at home, grow like weeds on all sides. In fact, we scarcely need to draw upon our European provisions at all except for butter and sugar.

From the first of December till two days after Christmas we stayed at N'Gayu, three days to the north of Avakubi, collecting mammals and other specimens which have been sent back to Avakubi. Our Christmas present was an old male chimpanzee captured on Christmas Eve.

A final word just received from the expedition, started June 30 from the Congo camp at Medje, north of Avakubi. With the introductory words, "There is only good news to be reported, all is well," there follows a triumphant record: 1200 mammals and 1500 birds are in the collections; a unique ethnological collection of 700 numbers has been gained from the Mangbetu; best of all, the okapi group is assured, not only in the possession of male and female specimens and young, but also, in that materials from the animal's haunt have been preserved and crated ready to ship, so that there promises to be reproduced in the near future in the American Museum of Natural History, New York, a small part of the mighty Congo forest with its strange life.

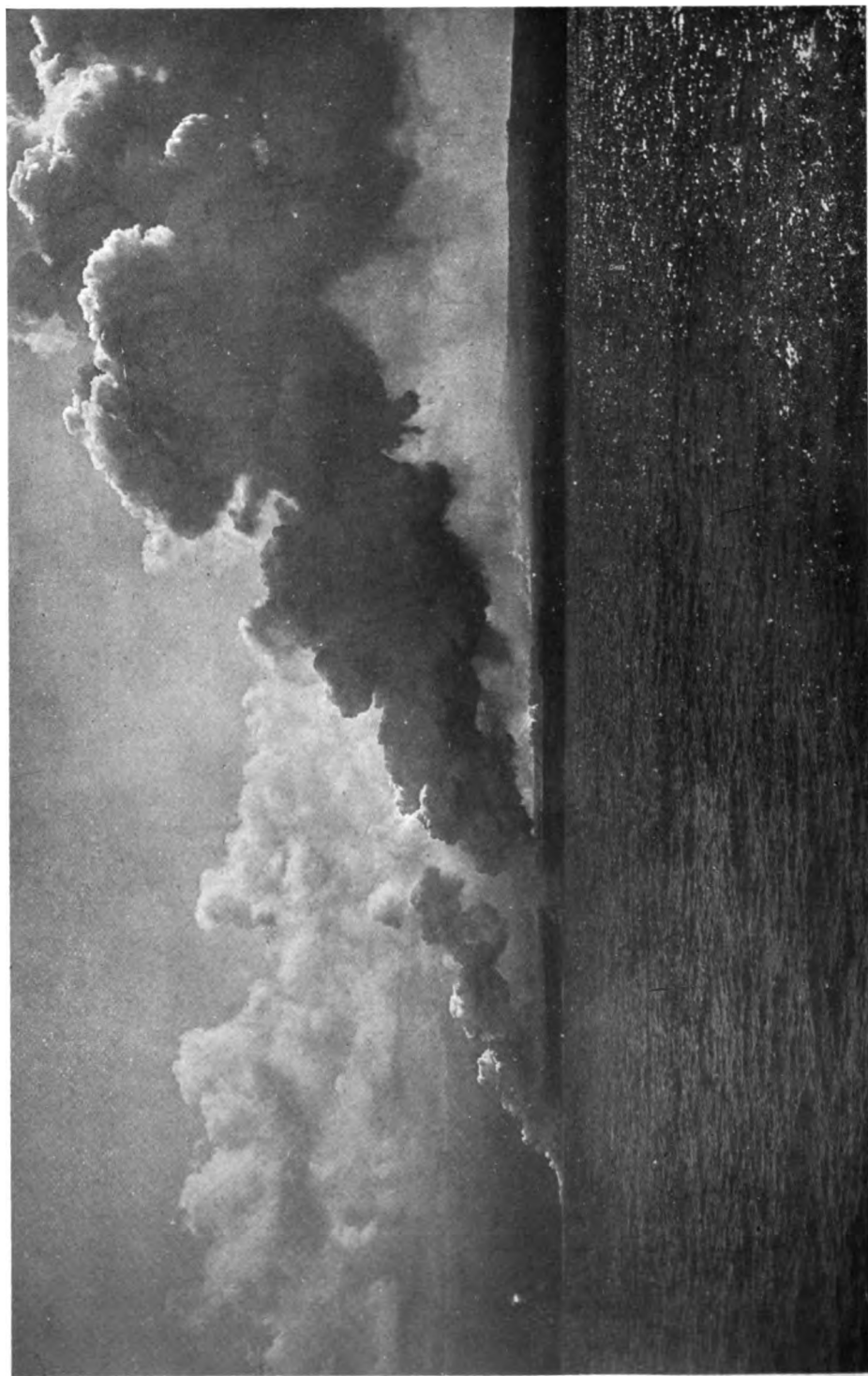
MARY CYNTHIA DICKERSON

TWO ACTIVE VOLCANOES OF THE SOUTH SEAS

WE were camped at the base of the volcano Savaii of the Samoan Islands and had climbed from our camp to the summit over the broken lava fields to see the fire of the volcano at night. Standing upon the extreme edge of the crater and looking down, the immense lake of lava four hundred feet below glowed almost as a continuous incandescent mass. Its light was reflected upon the clouds above, making a beacon that we had often seen from a distance of forty miles and which was said to have been visible at a distance of seventy miles during the period of the volcano's greatest activity about two years previous. Looking seaward, rosy vapors outlined the course of the lava down to the shore of the island where the fire of final lava cascades gave color to two huge clouds of steam. The fires illumined the scene so as to give light to guide a way over the broken lava, which is at best a precarious ground, and again and again through the night we climbed from our camp at the base of the cone to look down upon the fascinating but awful marvel.

Even when we saw it in the daytime, it was hard to realize the scene actual and not an imaginary panorama of Dantesque infernal regions. The yawning cavity of the crater extended a full half mile in length, and its width was more than four hundred yards. Almost perpendicular and sometimes undercut, the crater walls dropped hundreds of feet to the lake of molten lava, which was in such violent commotion that it seemed to be liquid flame rather than a mass of fused and fiery rock. At certain places it boiled with unusual activity, sending huge jets and fountains high into the air. Its waves moved hither and thither at different times, but now and then they would surge heavily and dash against the wall where the lava made its final way to the ocean. And always from this surface, thin steam-like vapor charged with acid gases swirled upward in the draught caused by the strongly-blowing trade winds, making it unpleasant to look over the edge even from the windward side.

We had begun the ascent of the volcano early in the afternoon in order to reach the crater before dusk. Proceeding through the undestroyed woods of a neighboring valley we entered upon the lava field at a point some miles from the coast, thus obviating the necessity of traversing its whole extent from sea to crater. Our natives, bearing food and water, now



SAVAII VIEWED FROM THE SEA

Volcano, and portion of the north coast of the island. The clouds of steam are caused by molten lava pouring into the ocean



WESTERN LIMIT OF THE LAVA FIELD ALONG THE SHORE

Continually more territory has been devastated as wave after wave of fluid lava has swept downward from the crater of Savaii



THE CONE OF SAVAII

The cone is 400 ft. from base to crest. The margin of the crater shows above at the left

tied the husks of cocoanuts to their naked feet for protection in walking over the broken lava, and after a final pause for rest, we left the shade and tempered heat of the tropical forest for the open glare of the volcano's slope. Viewed from afar, this slope seems even and smooth, but in reality it is like a tempestuous ocean suddenly arrested in its movements and turned into stone. Here and there wide sheets of lava with corrugated rippling surfaces formed still rivers between massive banks of cinders through which their molten substance had earlier ploughed its way; larger and smaller tables of crust, like broken floes of the Arctic Ocean, were tilted up and piled in strange heaps. And so vitreous was the material of this sea of black broken rock that the light was reflected from millions of crystal surfaces and facets as from so many fragments of ice or glass.

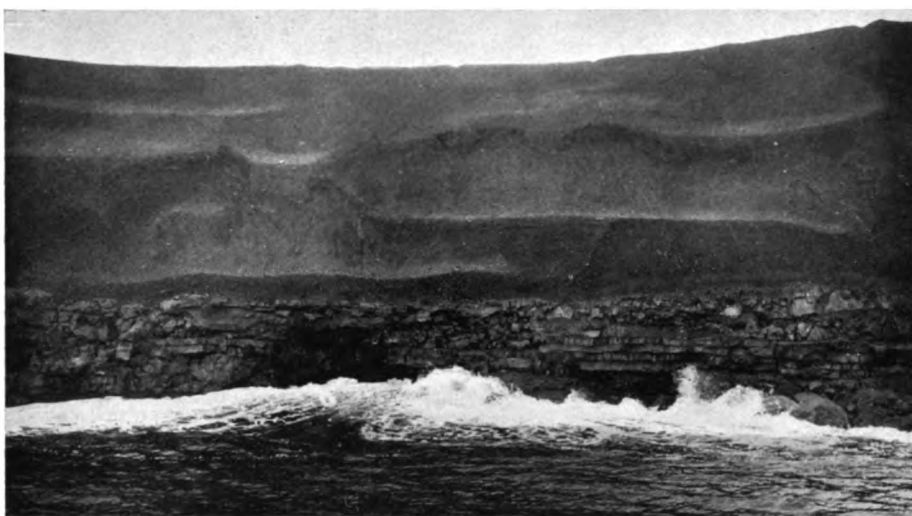
Progress over this field was necessarily slow, but by following the general trend of the less broken lava streams, we gradually worked upward and toward the main axis of the whole lava mass, indicated by vents which gave egress to steam and gases discharged by fluid lava running through tunnels beneath the surface.

The great crater we found a perfectly typical cone of cinders and lava, with a height from base to summit of four hundred feet as measured by the aneroid barometer. On three sides it is composed mainly of ashes and pumice, but toward the sea its surface displays smoother areas of rock where the lava formerly welled over the edge before the tunnels were formed by which the discharge now takes place. Large bombs, rounded masses of lava hurled from the crater during some explosive eruption, occur on the slopes, sometimes covered as by a sheet of tar with a later-extruded layer of lava.

It was in the course of my fourth journey among the islands of the Pacific that I made the ascent of this remarkably active volcano formed about five years ago on the island of Savaii, the largest member of the Samoan group. It happened that my investigations of the distribution of the land snails of Polynesia demanded for comparative data a thorough exploration of volcanic islands of great age, islands that for many centuries have been sculptured by the elements till they present alternating ridges and valleys radiating from their high central peaks. Tahiti is perhaps the most beautiful example of such an island. In many cases the several islands in the Pacific groups are of different geological ages, and consequently display different degrees of weathering. They thus form a series of stages to show how ancient rugged islands like Tahiti and Moorea may have been derived from the newly formed volcanic mountains like those of the Hawaiian and other groups which possess relatively even sides with lava fields unfurrowed by erosion.



CRATER MARGIN, SAVAII, FROM THE SEAWARD SIDE
 Savaii holds supreme rank among volcanoes of to-day for rapidity of development



SEA WALL NEAR THE CASCADES OF MOLTEN LAVA
 Cinders and lava, layer upon layer, between volcanic field and sea

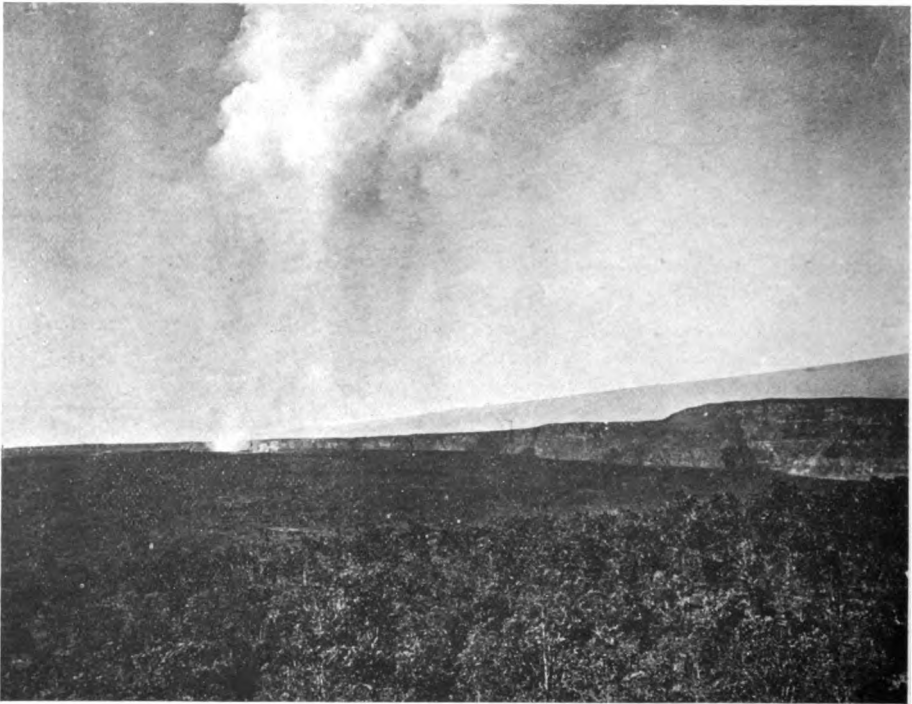


RUINS OF STONE HOUSES
 Trees were not consumed because of rapid cooling of the lava



MAUNA LOA, HAWAII. VIEWED FROM THE SEA

The even slopes, bearing secondary cones, rise slowly and grandly to a high summit



"HALEMAUMAU", HOUSE OF PERPETUAL FIRE

Floor of the main crater basin of Kilauea, the jet of vapor marking the fire-pit of incandescent lava. Kilauea has been active continually for more than a hundred years

It is true that I was interested in these Pacific islands also for reasons less closely connected with my work. For instance, the various islands give evidences of great changes in the level of the ocean bed and also explain the rôle played by corals in the construction of many types of islands. With few exceptions the islands occur in groups or chains suggesting the conclusion that they are the peaks of a range of mountains formerly connected by lowlands but now separated as the result of a subsidence of the ocean's floor. Every one is familiar with the theory that a coral atoll, consisting of a living reef bearing a more or less extensive series of coral islets, is built upon such a volcanic peak, which, according to Darwin and Dana, has been withdrawn below the water's level and overgrown by coral as it slowly subsided. It may be, as Agassiz contends, that a coral atoll is built upon a submarine volcanic mountain upheaved from the ocean's floor; but in either case the relation between coral reefs and volcanic peaks is one that possesses a real importance for the zoölogist.

The two volcanoes of Savaii and Kilauea occur in island groups that are in every way typical of the so-called "high" islands of the Pacific Ocean. The Samoan Islands, containing Savaii, lie almost on a straight line running nearly east and west. Upon examination they prove to be of various ages, for the westernmost, Savaii, bears the volcano that is active and has other indications that it is more recent in origin than its neighbor, Upolu; this island, in its turn, is younger than the more rugged Tutuila and Manua to the east. The Hawaiian Islands, containing Kilauea, also range with some regularity along a line, which in this case runs west-northwest and east-southeast; but one very interesting difference consists in the fact that the newest island, Hawaii, lies at the eastern end of the group, while the relative geological ages of the other islands correspond with their serial geographical order westward to Kauai, the oldest and most sharply sculptured member of the group. In all other essential respects, the Samoan and Hawaiian Islands are closely similar.

The new volcano on the island of Savaii is assuredly very impressive. Its total mass is great, but this feature is not so striking as its remarkably rapid development in the short period of five years; this development and the continual flow of fiery lava from its vast crater entitle it to supreme place in the array of volcanoes now in activity. It lies about eleven miles back from the coast nearly opposite the middle of the north shore of Savaii, which is roughly rhomboidal in outline and forty miles long. Approaching this part of the island by day, the most striking features of the panorama are the two vast clouds of steam that rise from the places where molten lava pours in cascades into the ocean. Upon the glistening black slopes beyond, jets of vapor mark the vents in the roofs of the tunnels through

which the fluid lava runs upon its seaward journey from the crater; and from the crater itself, two thousand feet above sea level, rises a similar fountain of thin steam that quickly merges with the dense clouds above.

When one looks upon the enormous mass of this new mountain, it seems impossible that five years could be sufficient for its formation, yet this is actually the case. The first crater appeared in August, 1905, upon the floor of a beautiful green valley. As cinders and lava were sent out, they gradually built up a larger dome and spread out to form the first strata of the great volcanic field. The flow followed the valley to the ocean, but as wave after wave of fluid lava or steam-charged ash swept downward, more and more territory was devastated, while the lava, already cooled to form ridges and hillocks, diverted the later lava rivers into irregular and wider-spreading channels. Reaching the ocean, the molten rock poured into the depths of the sea over the coral reef, building ever outward, at the same time that it followed the reef and shore so as to spread over a section of the island represented by a five-mile arc of shore. Naturally the seaward wall of the whole lava field is highest near its midline where it measures eighty or ninety feet. This wall displays a regular series of strata of prismatic blocks or tables, formed by the cooling of successive sheets of flowing lava. These strata sometimes lie between masses of cinders, showing how the eruptive output varied in character during succeeding weeks and months. Toward either side, the whole field gradually thins out, and at its western edge ends in a series of rough rocky billows, seared and broken by their contraction in cooling. Yet their materials reached this point as red-hot fluid lava, having journeyed a route that must have been nearly fifteen miles in length.

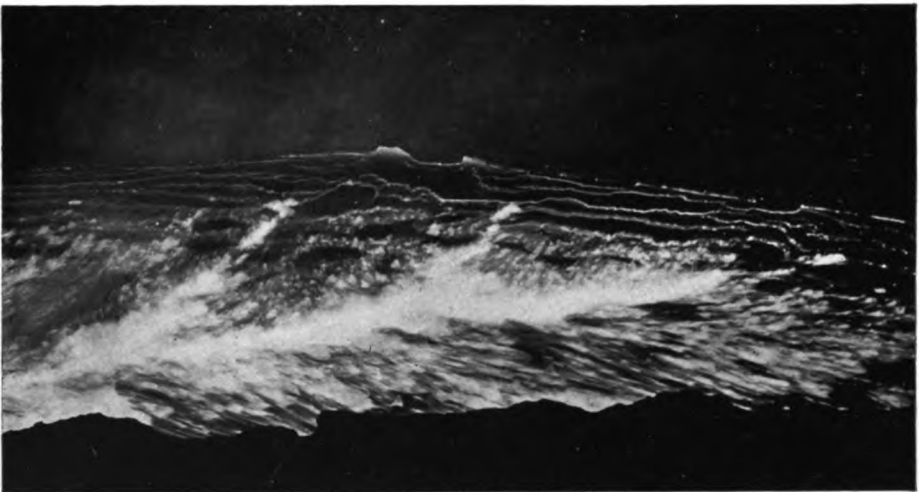
As the molten lava first swept down the valley and along the strand, we can see that its destructive affects were rapid and complete. It was only where there were walls of coral limestone, like those of the churches and traders' warehouses that anything could withstand the flood of rock; the wooden huts of the seaside villages were entirely consumed. Yet so quickly did the surface of the plastic mass become cool, that the cocoanut and other trees, felled by the burning through of their bases, were rarely consumed.

Turning to the volcano Kilauea of the Hawaiian Islands, we find it in many respects quite different from Savaii of the Samoan group. It is an accessory outlet upon the side of the giant volcanic mountain of Mauna Loa, whose main crater at the summit, more than thirteen thousand feet above the sea, is active only at very long intervals. There is a journey of two hundred miles from Honolulu to the island of Hawaii on which Mauna Loa occurs; viewed from the ocean on approach, the even slopes of the mountain rise slowly and grandly to the high summit, bearing numerous secondary or "parasitic" cones which have been formed by sporadic local eruptions.



THE "LAKE OF FIRE" OF KILAUEA

Jets of molten lava are thrown up along lines of greatest activity



THE "LAKE OF FIRE" OF KILAUEA AT NIGHT

The photographic film was exposed four seconds

The first view of Kilauea itself is somewhat disappointing to one who has recently witnessed the grandeur of the eruption at Savaii, but closer acquaintance reveals many features of great interest. Kilauea lies about four thousand feet above the level of the sea, and is about twenty miles back from the coast. In general structure it is a wide shallow basin over three miles in diameter, depressed below the general level of the slopes of Mauna Loa. At quite a little distance from the geometric center of the lava field which forms the floor of this basin is the active fire-pit, marked during the day, as at Savaii, by a cloud of vapor, and at night by a marvelous pillar of fire.

The well-beaten trail to this center of activity leads down along the terraced wall of one side to the almost level floor of the main basin. In the strongest contrast to Savaii, Kilauea's lava field is remarkably even; indeed the best areas of the former are far more broken than the most irregular parts of the latter. The surface undulates more or less, it is true, while here and there broken masses form hillocks and ridges, but the active vent has given forth the molten lava with comparatively little disturbance. Since the middle of the nineteenth century enough rock has poured out into this wide basin to reduce the height of its vertical walls from more than eight hundred feet to about four hundred.

In December last, Kilauea was unusually active after a period of relative quiet. The fire pit is nearly circular in outline and its walls fall in two terraces to the small pool of molten lava, about two hundred feet below the natural level of the whole basin. Its general structure has varied more or less in past decades, as well as its degree of violence, but it has been a permanent center of eruptive activity for more than a hundred years, well deserving the native name of "Halemaumau," the House of Perpetual Fire.

Here as at Savaii the surface of the pool is in constant commotion, but the areas of incandescence are much restricted and run in parallel or forking lines. Cakes of congealed lava float between these lines, and when in their movements they reach the neighboring areas of greater activity, they are redissolved and their fragments are thrown into the air together with jets of more fluid lava. Photographs taken at night exhibit with great distinctness the primary and minor areas of greater activity that form a network upon the surface of the pool.

HENRY E. CRAMPTON

A NEW SWORDFISH MODEL

GREAT interest prevailed in the Department of Preparation one hot Saturday forenoon in late July when a swordfish, a very perfect 130-pound representative of its race, was brought there as a gift from one of the Museum's members, Mr. George McKesson Brown. The fish was in fine condition for casting; it had been put, as soon as captured, into a specially constructed zinc-lined tank filled with ice, then after a hurried sail to New York, had been removed from the yacht's deck to the Museum, still in its ice-filled tank.

The staff of the Department dropped other work and under the direction of Dr. Louis Hussakof and the donor set out to pose the fish, ready for the manipulation of clay and plaster about it. The body was made to curve slightly as if in motion. The tail fin was placed stiffly in the position in which it cuts the water as it moves rigidly from side to side. This rigid widely-forked tail fin, contrasting with the curving flexible tail fin of a shark, announces the identity of the swordfish to the fisherman watching with harpoon ready at the prow of his boat. The "sword" was posed straight out in front, more than three feet in length, slender and rapier-like, a weapon made by consolidation of the upper jaw bones. It is this sharp-edged instrument that is said to prove so deadly to a school of fish. The swordfish rises fully into air above the prey, turns on its side and drops — a long, slender form glistening in air momentarily. Then the many small fish sharply cut in two by the descending weapon are followed and picked up as they settle to the bottom. The men in the taxidermy shop continued to work throughout the day but as a result, at night, there lay beside the fish a two-piece mold, perfect imprints of the two sides of the fish.

The adaptation of a swordfish to endure high pressure is said to be remarkable. A diver who can stand a greater pressure than sixty or seventy feet is difficult to find, to stand one hundred feet is most unusual, although there are extreme cases in which the record is higher than this. It is said that the usual sub-marine boat can endure little more than one hundred and fifty feet depth, its standard power being to maintain a depth of seventy-five feet; yet a swordfish, according to Mr. Brown, will reach a depth of twelve hundred feet. When harpooned and given freedom, fastened only to a floating keg, it may carry a two hundred fathom line straight down till taut. If the line is too short to reach the bottom, the keg will be dragged under, staves and hoops will rise to the surface, resulting in the loss of the fish to the pursuing boat.

This specimen, the cast of which will be put on exhibition soon, measured nine feet in length and was caught about forty-five miles off Block Island, a region the fish reaches in July, appearing off No Man's Land a little later, and as far north as Bar Harbor in August. The swordfish is the only species of its kind. It belongs to the mackerel type with body greatly narrowed just in front of the tail fin, the rapid motion of the slender posterior end of the body and of the tail fin sending the fish at high velocity through open seas. It is reported to be a creature radiantly beautiful in sun-lighted water, as with grace of form and motion, clothed in the iridescent colors of feldspar, it now shimmers in contrast with the hues of the sea, now blends with them. The swordfish has strength even great enough to penetrate ships and, as is proved by many authentic reports, has often had the inclination to use this strength. The species, although widely distributed through the seas of the world, has recently become more rare. Fishermen fear that in a very short period of years it will be extinct along the Atlantic coast.

A NOTE FROM THE FORESTRY HALL

THE Honorable Mr. Karl Petraschek of Vienna, who is in America to study forestry conditions, stopped in New York this summer on his way to Washington and the West and spent several days studying the collection of North American trees in the Museum's Forestry Hall. Mr. Petraschek has been Chief Forester of Bosnia and Herzegovina for more than twenty years. In addition to this practical work in Austria, which includes the famous reclamation of the Karst, a 600,000-acre tract of barrens, he has studied the forests of other countries also, namely, Germany, France with Algeria and Tunis, Norway, Sweden, Denmark, Roumania and Servia, this last country through having been called there as expert for the reorganization of Servia's system of forest management. Mr. Petraschek's pleasure in the Jesup Collection was great; he declared it to be, quoting his words, "a sample for the world, in its complete display of the wood itself, in arrangement and 'groupment,' as made now for a great part of the hall, in the models of leaves, flowers and fruits, which are so like nature that they give a better idea than a good picture, and also in the labels, especially those with small maps, indicating graphically the dispersal." America can learn much from Europe in all forestry matters. As proof stand the four months of study spent last winter in Germany by forty-five Americans, sons of lumbermen and forest owners and students of the Biltmore Forest School. It is therefore gratifying to realize that

in the opinion of expert European authority, President Jesup's inception of the American Museum Wood Collection with its complete representation of distribution maps and the recent work which has added flower and fruit models and arranged the trees in natural groups, have produced an exhibition unsurpassed in excellence.

THE ANNUAL SCOURGE OF FLIES AND MOSQUITOES

Exhibition Hall labels must necessarily be brief. For those who are especially interested in some given subject, much must be left for explanation by other means. These notes on household insects have been prepared to supplement the exhibits which are being arranged in the Hall of Local Insects, since inquiries pertinent to the subject come both from members of the Museum and others almost daily by letter, telephone and word of mouth.

THE old method of prolonging life through the quest for an elixir of life has fortunately been replaced by the modern method of gaining control of the preventable causes of premature death. Of these causes to-day nothing is to be compared in disastrous results with the infectious or germ disease. One of the greatest discoveries made in the work of getting control of germ diseases has been the relation between their dissemination and common insects, insects so accepted by the world as necessary evils that there has been great difficulty for public opinion to grasp the far-reaching force of the discoveries and the tragic meaning of past years of ignorance. That where there are no mosquitoes, there will be no malaria and no yellow fever, is a fact now proved beyond dispute. That Africa has so often been the "white man's grave" has not been the fault of Africa so much as of the white man's lack of knowledge of the relations between the sleeping sickness and other fevers prevalent there and insects, especially of flies and mosquitoes.

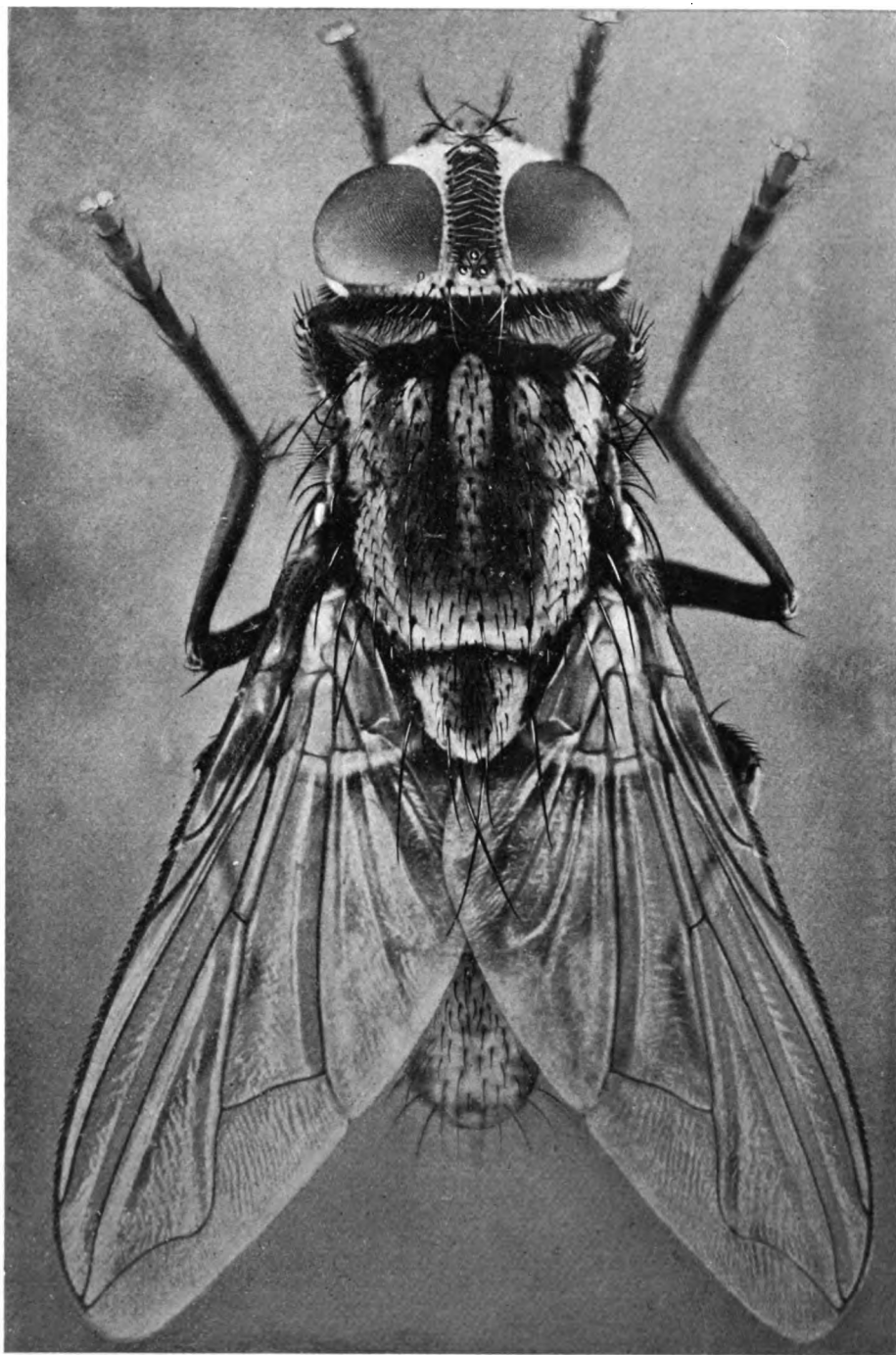
The Typhoid-Fly, as the United States Entomologist has suggested that the common house-fly, *Musca domestica*, be called, is the most abundant insect of this vicinity. It carries the germs of typhoid and many other diseases, especially of those intestinal in character, on the sticky pads of its feet, on its proboscis and in its digestive apparatus. Its eggs are laid in foul matter where the larvæ feed and change to pupæ. Upon emerging from the pupal cases, the flies wing themselves perhaps to other foul places, perhaps to the nearest kitchen or dining-room, to sick-chambers, to the children in the streets, always returning to accumulations of foul matter for the purpose of depositing eggs. It is unnecessary to say more. These facts prove the need of an active campaign, increasing in force with the

return of each summer, especially when combined with the fact that of the 23,087 flies collected by Dr. L. O. Howard from dining-rooms in different parts of the United States, 22,808 were of this typhoid species.

To screen our windows is but a partial remedy against the scourge, for shops from which food comes may remain unscreened. To rid ourselves of the fly we must do away with its breeding places; there is no other way. This means work for the Board of Health in every city, and coöperation of all members of communities everywhere, but it is the one road toward protection from fly-born sickness and death.

The Malaria Mosquito, *Anopheles maculipennis*, is likely to insert the germs of malaria when it pierces the skin, and that it is only the females that "bite," is no consolation since their number is legion. There are 15,000 deaths annually from malarial fevers in the United States, yet this disease can be spread only through the agency of this insect. All mosquitoes, unless it be the striped-legged form of the seashore, should be looked upon with suspicion, for the points of difference between the malarial and non-malarial forms are too minute to be of general help in distinguishing them. The ravages of the malaria mosquito can be checked, just as can those of the typhoid fly, by getting rid of its breeding places. This work also must be communal, the method varying with the conditions. Swamps and pools should be drained whenever possible. Where draining is not practicable, they can be kept free from mosquito larvæ by covering the water with a film of oil. The larvæ coming to the surface to breathe cannot break through the film and so suffocate; however, as the oil evaporates rapidly, it must be renewed every week or two. Ponds, brooks and fountains may be kept relatively free by introducing goldfish or top minnows, if the banks have been cleared of weeds so that the fish can patrol the entire surface. Rain barrels and water tanks should be screened or stocked with fish: even tin cans and bottles which fill with water during rains may prove ruinous to the health of a community and should be buried or disposed of in some safe way. Much work has already been done in eliminating mosquitoes from infested regions, but — and this is the rock on which many mosquito campaigns have been wrecked — the action must be communal and compulsory, one ignorant or obstinate landowner easily making of no avail the work of a hundred.

FRANK E. LUTZ



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THE COMMON HOUSE-FLY OR "TYPHOID-FLY."

House-flies may carry living germs of typhoid fever on the sticky pads of their feet.
For structure of Malaria Mosquito, see enlarged model in the Museum, Darwin Hall

ADVENTURE WITH AN AFRICAN ELEPHANT

IT is fortunate indeed that Mr. Carl E. Akeley is recovering from the rather serious injuries received while elephant hunting in Africa this past summer. He came upon a herd unexpectedly and before he could take aim at the giant fellow nearest, the huge tusks were immediately upon him. Mr. Akeley swung himself between the tusks, grasping one with each hand, but was borne to the ground under the elephant's trunk and body. In a letter of July 20 to Director Hermon C. Bumpus, he writes:

Four weeks ago, while in quest of a spot to make studies for the elephant group, I ran on to the trail of several bulls. The trail was old, but I followed it and came up with the herd the next day quite unexpectedly in dense jungle. One of them saw me first, used me for a "prayer rug" and got off scot-free. I can walk a little now, and have reason to hope that in another month I may be able to return to the forest, though it may be much longer before I can undertake the work of caring for an elephant's skin. I should like to meet once more the elephant who drew first on me.

Mr. Akeley, the noted collector of big African game, has had much previous experience in elephant hunting. He is responsible for the elephants as well as for the taxidermy work in connection with the group in the central foyer of the Field Columbian Museum, a group masterly in its action and in its portrayal of animal character. But the risk in elephant hunting is always great even to the experienced. As Colonel Roosevelt says: "...there are few careers more adventurous, or fraught with more peril, or which make heavier demands upon the daring, the endurance, and the physical hardihood of those who follow them."

Mr. Akeley left New York in the summer of 1908 for British East Africa to make collections for the American Museum, especially to insure an elephant group for the African Hall. His aim has been, therefore, not only to get elephants but also studies and materials for the reproduction of their habitat. It was this that took him to Mount Kenia, the place from which his last letter was sent; on this mountain he reports elephants living at an elevation of 1400 feet. His work of getting possession of the elephants has been slow of achievement because most of the great tuskers have fallen before the continual raids for the ivory trade. Quoting again from his letter:

Since January, I have inspected well over one thousand elephants here and in Uganda, but have not been fortunate in finding the desired perfect specimens. I am determined that the old bull shall be as near right as possible even if it takes another year. Uganda is undoubtedly the place to get big elephants, but they are becoming rare. They are hounded incessantly by sportsmen, poachers, traders and

natives. The wonder is that there is a good one left. One that we shot in Uganda carried tusks of seventy to eighty pounds weight, but owing to the huge bulk of the animal, they appeared small. This elephant was of size sufficient to carry two-hundred-pound tusks gracefully.

Mr. Akeley tells of an interesting discovery he made at Mount Kenia owing to his habit, offensive to his followers, as he says, of "pounding" across country by compass regardless of well-known trails. He found the shelter where a baby elephant had been born and was spending the early days of its existence while the mother fed about in the neighborhood. It was on the extreme point of a ridge, well off the elephant trails and feeding grounds. He was first attracted to the spot by the remarkable appearance of a tree which, hung with an enormous mass of aerial roots, made a canopy for the shelter.

MUSEUM NEWS NOTES

AMONG the recent gifts to the Museum are the Lender's collection of costumes of the Plains Indians, presented by Mr. J. Pierpont Morgan; a valuable collection of Navajo blankets presented by Mrs. Russell Sage; and two specimens of the African elephant as well as two of the square-mouthed or white rhinoceros, collected and presented by the Honorable Theodore Roosevelt.

A memorial tablet to the late Jonathan Thorne has been placed in the Museum's room for the blind, recently endowed by the bequest of his daughter, the late Phebe Anna Thorne. The tablet is a bronze bas-relief of Mr. Thorne and was designed and executed by Chester Beach of New York.

SINCE our last issue the following persons have been elected to membership in the Museum: Patrons, MESSRS. OGDEN MILLS and FELIX M. WARBURG, HER SERENE HIGHNESS, PRINCESS VILMA LWOFF-PARLAGHY and MMES. RUSSELL SAGE and JOHN B. TREVOR; Life Members, MESSRS. F. LOTHROP AMES, C. FORSTER COOPER and STANTON D. KIRKHAM and MISS ELIZABETH BILLINGS; Sustaining Members, MR. CHARLES DE RHAM and MRS. C. M. PRATT; Annual Members, MESSRS. J. ADAMS BROWN, CLARENCE L. FABRÉ, EMIL FRENKEL, WILLIAM HAGUE, ROWLAND G. HAZARD, JAMES HENRY, LOUIS A. HILDEBRAND, STANLEY D. MCGRAW, S. K. REED and GEORGE M. THORNTON and MMES. CHARLES A. POST, J. CLIFFORD RICHARDSON and CHARLES B. ROWLAND.

PRESIDENT OSBORN left August 5 for a journey in the West, returning to the Museum September 19. He visited the Big Horn Basin of Northern Wyoming, where a field party under Mr. Walter Granger is carrying on explorations for the earliest known ancestors of the horse and of other mammals in America, the especial object of the work being to secure the complete history of the life of this section of the country in lower Eocene times. President Osborn also visited the new Glacial National Park of Northern Montana, which since the last session of Congress has been added to the system of National Parks. This park is a superb region, embracing the wildest and finest mountain scenery in the United States. It contains no less than sixty glaciers and includes the summit of the Rocky Mountain System, lying about forty miles immediately south of the Canadian boundary.

BEFORE his departure for the West, President Osborn sent to the press his volume on the "Age of Mammals." This book is to be published by the Macmillan Company in October and will be the first popular summary of the results of the palæontological explorations of the Museum during the past twenty years. It is illustrated largely from the Hall of Fossil Mammals and from photographs collected by the Museum's field expeditions.

DR. JAMES DOUGLAS is having prepared for the Museum at his expense, a large model of the Copper Queen Mines, the property of the Copper Queen Mining Company, Bixby, Arizona. This model, showing the construction of tunnels and the various processes of extracting and treating the ore, is the first step in Museum representation of the industrial side of geology. Dr. E. O. Hovey has charge of the field studies preparatory to the construction of the model. He left for Arizona early in August, accompanied by Messrs. A. Breismeister, William Peters and Thomas Lunt. They will return to the Museum about the first of October.

DR. CHARLES H. TOWNSEND of the New York Aquarium is serving the Museum as Acting Director during a six-months' leave of absence of Director Hermon C. Bumpus.

PROFESSOR HENRY FAIRFIELD OSBORN has been appointed Honorary Curator of the Department of Vertebrate Palæontology and Dr. W. D. Matthew has been promoted to the position of Acting Curator.

DR. C. H. TOWNSEND has recently presented to the Museum fourteen specimens of Hawaiian Island birds from the collection of the late Edward Hitchcock of Hilo. Not one of the eight species represented was previously contained in the Museum's collection of birds, which is deplorably deficient in Hawaiian material.

A recent addition to the Dinosaur Hall is a skeleton of *Cryptocleidus oxoniensis*, a Plesiosaur from the Oxford Clays of Peterborough, England, dating from the Upper Jurassic. This specimen was obtained by exchange from the British Museum and is unusually complete, the principal restored parts, carefully modelled from other well-preserved skeletons, being the head and the outer ends of the paddles.

PROFESSOR C. E. A. WINSLOW, Curator of the Department of Public Health, delivered a paper, "Waste of Life Capital in American Industries," at the summer conference of Mayors, Schenectady, convened to discuss municipal health problems.

PROFESSOR HENRY E. CRAMPTON sailed from Naples September 9 after a summer spent in touring through Europe. During his travels he visited the principal European museums, noting methods of exhibition, and studying the collections of terrestrial snails. In August he attended the session of the International Congress at Gratz, reading there a paper covering his investigations on land snails made in four journeys to the islands of the South Pacific.

SINCE March of the present year, Mr. Roy C. Andrews of the Museum staff has been studying and collecting the Cetaceans taken at the whaling stations on the west coast of Japan. To date he has secured skeletons of whales according to the following list: finback more than 69 feet long, humpback 47 feet long, sperm 60 feet long, sulphurbottom 78 feet long, and two kill whales 22 and 28 feet respectively. In addition, he has procured a number of skeletons of several species of porpoises. These skeletons, four of which have already made the long journey to the Museum, were presented to the Museum by the Oriental Whaling Company of Japan. At the various stations Mr. Andrews has been received with the utmost courtesy by the Japanese and every facility has been extended to him for carrying on the work. A detailed report of his work will appear in a later number of the Journal.

MR. ALANSON SKINNER of the Department of Anthropology has made two field excursions this summer. The first was to the Menomini Indians residing on their reservation in northern Wisconsin. From these people, Mr. Skinner obtained an exhaustive collection. He was especially successful in being able to secure some very important religious objects including five medicine bundles. The second expedition was to the Seminole Indians dwelling in the Big Cypress and the Everglades of Florida. On this trip also, a large collection was made, and will shortly be placed on exhibition in the Museum.

MR. ROY W. MINER, Assistant Curator in the Department of Invertebrate Zoölogy, spent the month of July at Woods Hole, Mass., making ecological studies and gathering material for Museum groups to illustrate typical associations of marine life, especially the fascinating fauna of wharf piles. During August, he studied rock tide-pools, first at Nahant, Mass., and later at South Harpswell, Maine. He was assisted in the work by I. Matausch and H. Müller, preparateurs, S. Shimotori, artist, and Thomas Lunt, photographer.

DR. ALEXANDER PETRUNKEVITCH, Honorary Curator of Arachnida, has accepted a position in the Department of Zoölogy at Yale and will assume his new duties at the beginning of the current university year.

MR. J. D. FIGGINS, Chief of the Museum's Department of Preparation, has gone to Denver to assume the Directorship of the Colorado Museum of Natural History.

JUST as the JOURNAL goes to press, a letter dated Cape Parry, Arctic Ocean, March 13, comes from Mr. V. Stefánsson, and one written from Baillie Island from Dr. Rudolph M. Anderson. These letters give the adventures of the Museum's Arctic Expedition and the results of work during the months from September 1, 1909 to March 6, 1910. Unusual difficulties have been experienced in the matter of getting a living from the frozen country. Sometimes the men have been without food for days or have been reduced to forcing down their throats what seems impossible food, such as rubbery, raw sealskin, or ptarmigan feathers and long-haired deer-skin soaked in clear seal oil. In fact, at one time starvation reduced them to use as food and sacrifice to the minimum the skins that served them for clothes and bedding. A full report with extracts from their letters will be given later.

AFTER several months spent among the Crow Indians of Montana, Dr. Robert H. Lowie is at present at work among the Hidatsa of the Fort Berthold Reservation, North Dakota.

DRS. GODDARD AND SPINDEN of the Department of Anthropology are attending the Congress of Americanists in Mexico City after which Dr. Spinden will again take up his work among the Rio Grande Pueblo of New Mexico.

THE AMERICAN FISHERIES SOCIETY, which held its fortieth anniversary in New York City, September 27-29, met at the American Museum of Natural History September 28, at which time the members of the Society were the guests of the Museum at luncheon.

MR. FRANK M. CHAPMAN, Curator of Ornithology, addressed the National Conservation Congress at St. Paul, September 7, on "Practical Bird Conservation." Before demonstrating with the aid of lantern slides and motion pictures practical methods and results in the conservation of birds, Mr. Chapman explained why protection is essential and called attention to the relation between birds, insects and forests, giving statistics in regard to the depredations of insects injurious to trees and also data showing to what extent birds feed upon these insects.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The first course of lectures for the season 1910-1911 to Members of the Museum and persons holding complimentary tickets given them by Members will open in November.

PUPILS' COURSE.

The lectures to Public School children will be resumed in October.

PEOPLE'S COURSE.

Given in coöperation with the City Department of Education.

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of seven lectures by MR. ARTHUR STANLEY RIGGS on "Historic Italy from Sea to Sea." Illustrated by stereopticon views.

October 4.—"Down the Riviera: The French and Italian Shores of the North."

October 11.—"Florence: The City of Art Transcendent."

October 18.—"Pisa — Genoa — Venice: 'They Who Go Down to the Sea in Ships.'"

October 25.—"Rome: The Quick and the Dead — A New View."

Saturday evenings at 8:15 o'clock. Doors open at 7:30. The first four of a course of six lectures on "Evolution" by PROFESSOR SAMUEL C. SCHMUCKER. Lectures of October 15, 22 and 29 illustrated with stereopticon.

October 8.—"Charles Darwin,— a Master Mind."

October 15.—"Natural Selection,— a Master Idea."

October 22.—"Fossil Evidences for Evolution."

October 29.—"What a Chicken Can Teach Us."

Children are not admitted to these lectures, except on presentation of a Museum Member's Card.

MEETINGS OF SOCIETIES

Public meetings of the New York Academy of Sciences and Affiliated Societies will be held at the Museum according to the following schedule:

On Monday evenings, The New York Academy of Sciences:

- First Mondays, Section of Geology and Mineralogy;
- Second Mondays, Section of Biology;
- Third Mondays, Section of Astronomy, Physics and Chemistry;
- Fourth Mondays, Section of Anthropology and Psychology.

On Tuesday evenings, as announced:

- The Linnæan Society of New York;
- The New York Entomological Society;
- The Torrey Botanical Club.

On Wednesdays, as announced:

- The Horticultural Society of New York;
- The New York Mineralogical Club.

On Friday evenings, as announced:

- The New York Microscopical Society.

The programmes of the meetings of the respective organizations are published in the weekly *Bulletin* of the New York Academy of Sciences and sent to the members of the several societies. Members of the Museum on making request of the Director will be provided with the *Bulletin* as issued.

The American Museum Journal

MARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,
LOUIS P. GRATACAP, } *Advisory Board.*
WILLIAM K. GREGORY,

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A DETAIL OF THE FLAMINGO GROUP

Protective coloration evidently plays no part in the lives of adult flamingoes. They are protected by the nature of their haunt and by excessive wildness

The American Museum Journal

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NOVEMBER, 1910

No. 7

PROTECTIVE COLORATION IN THE HABITAT GROUPS OF BIRDS

WHILE the habitat groups of birds make their strongest appeal to most Museum visitors through the universal love of the beautiful, it must not be forgotten that mounted specimens placed in a natural setting permit study of the animal in relation to its environment. The origin of the name "snake-bird," for example, as applied to the Anhinga is at once obvious when one sees in the group representing this species the bird swimming with the body submerged and only the slender sinuous snake-like neck and head exposed. The wading stilt, betraying the function of the exceptionally long legs, and the feeding flamingo, with upturned bill pressed into the mud, also illustrate the importance of natural surroundings for exhibition specimens.

The necessity of seeing the bird in its natural habitat is particularly evident when one attempts to explain the relation between the color of an animal and its immediate environment. Nearly every one of the habitat groups of birds will present some evidence in support of this fact. Let us look, for example, at the first group to the right as we enter the hall. It is based on studies made on Cobb's Island, Virginia, and contains, among other birds, numerous black skimmers with their newly hatched young. Several of the latter, mounted directly from photographs from life, are shown in the pose they assume at the command of the parent in the presence of danger, and are so flattened out against the sand that they seem almost to fuse with it; even in the group they are remarkably inconspicuous, while in life they are almost invisible.

The inquiring visitor noting this fact will doubtless ask, how then is the correspondingly conspicuous black plumage of the adult bird to be explained; assuredly it is not protective, and a reply to the question is that the adult skimmer avoids observation by excessive wariness. Up to the time the studies for this group were made, no naturalist appears to have seen a skimmer on its nest, and it was currently believed that the bird sat upon its eggs only during the night. Observations and photographs made from a blind showed that the skimmer returned to the little hollow in the sand in which its eggs were laid, just as soon as it felt that it was not under



WHITE-TAILED PTARMIGAN IN SUMMER PLUMAGE

A portion of the Arctic-Alpine group. The female ptarmigan is protectively colored; she will allow herself to be touched before deserting the nest

in the cinnamon teal and ruddy duck. When molting, these birds, in common with grebes, murres and other diving birds, lose all their wing quills simultaneously and are consequently flightless until new ones are acquired. Apparently, therefore, to aid in their concealment during this comparatively helpless period, the males shed the more striking portions of their distinctive plumage which is replaced by a dull, neutral-tinted plumage like that of the female. This is worn only until they reacquire

observation. Indeed a thermometer would doubtless have proved the necessity of the bird's presence if its eggs were not to be cooked by the noon-day rays of a July sun.

Passing by the groups arranged along the side of the hall, each one of which has a biologic story of its own, we journey from the Atlantic to the Pacific and find the case of the skimmer practically repeated by the black-necked stilt in the San Joaquin Valley group. Here again is a conspicuous black and white parent, while the downy young wear an admirably disguising costume, which persists even to the plumage of flight worn by the half-grown stilt which is squatting in the vegetation at the water side. Note also in this group how effectively the color of the downy black tern in the foreground blends its wearer with the details of its nest.

This San Joaquin group contains a further illustration of protective coloration



A SMALL PORTION OF THE SNAKE-BIRD HABITAT GROUP

The origin of the name appears when one sees the bird swimming with only the head and the slender sinuous neck exposed

the power of flight when their full male costume is regained. The disguise, as it were, known as the "eclipse plumage" is well shown indeed by the cinnamon teal and ruddy duck in the San Joaquin group.

At the same end of this hall, but on the west side, is situated the really startling flamingo group. Protective coloration evidently plays no part in the lives of adult flamingoes, whatever it may do for their young, and these flaming creatures, which, as the birds in the background show, can be seen at a great distance, are protected by the nature of their haunts which permit them to see as well as be seen long before an enemy could reach them, in connection with a wildness which makes it impossible to approach near them without the exercise of the utmost caution, and that under favoring conditions. Furthermore, these brilliant birds are most abundant only on islets uninhabited by predatory mammals and where they find in abundance the small shells on which they mainly subsist.

Only one additional instance will be cited to illustrate further the value of these groups in connection with a study of the colors of birds. It will be found in the Arctic-Alpine group from the summit of the Canadian Rockies where white-tailed ptarmigan in summer plumage can scarcely be seen amid the heather and the lichen-covered rocks. A seasonal group at the entrance to the main bird hall below shows clearly how the plumage of this bird, keeping pace in its changes with the variations in its surroundings, prevents its wearer from ever becoming a shining mark for the numerous foes to whose attacks it is subject, but the group in question shows only the summer home and summer plumage of the birds, and it is especially significant to know that the female, found sitting on the nest here shown, actually permitted herself to be touched before deserting her eggs. Compare her actions with those of the skimmer, which avoids even being seen on its nest, and we have a convincing demonstration by the birds themselves of what constitutes a protective and what a non-protective plumage.

FRANK M. CHAPMAN

A NEW FIELD FOR MUSEUM WORK

THAT the Museum has created a Department of Public Health emphasizes its aim to develop scientific work along practical lines directly beneficial to the masses of the people. That it has placed at the head of this department a man whose previous work and interest have centered largely in problems of city water supply and sewage disposal comes with peculiar fitness at just this moment when for the past two months the water supplies in and about New York have been deficient in quantity and questionable in quality. Professor Winslow plans to build

up the new department along two somewhat distinct lines, bacteriology and municipal sanitation.

There is at present no comprehensive collection of bacteria in this country and workers who desire authentic cultures must send to Prag for them unless a neighboring laboratory happens to have the particular organism desired. In the bacteriological laboratory now being equipped at the Museum, the new Department will install and keep under cultivation a complete collection of bacteria, securing material from colleges and board of health laboratories in this country and in Europe. The Museum will thus be in a position to act as a central bureau for the distribution of bacteria, supplying the needs of corresponding laboratories and of schools and other institutions which may occasionally desire cultures. Such a bacteriological collection when established will furnish also an exceptional opportunity for studies of the systematic relationships of this group in which a better biological classification is greatly needed.

The public exhibits of the Department will deal chiefly with phases of municipal sanitation. The central idea will be to set forth some of the conditions which affect the life of the human animal in that form of commensalism which we call a city. Temporary exhibits will be prepared to illustrate the history and development of the more important phases of city life. For example, the first of these exhibits will deal with the problem of water supply sanitation, illustrating by models and specimens as well as by photographs and charts, the sources of water, its collection for public use, the danger of infection, the development of microscopic algae and protozoa in reservoirs, methods adopted for purification and resulting effects upon the public health. The history and development of the present and future sources of water supply of New York — an engineering undertaking second only in magnitude to that of the Panama Canal — will be graphically represented. The chief features of these temporary exhibits will be preserved for a permanent exhibit of Public Health, such as several German cities now possess, but of which there is no example in the United States.

Professor Winslow comes to the Museum from ten years of service in the Massachusetts Institute of Technology, where since 1905, he has been Assistant Professor of Sanitary Biology. In 1903, he was appointed Biologist-in-charge of the Sanitary Research Laboratory and Experimental Station, founded by the Institute at that time for the study and dissemination of knowledge with regard to sanitary questions. Professor Winslow was also Assistant Health Officer in Montclair, New Jersey, during the summer of 1898 and did special work in the Engineer's Office of the Massachusetts State Board of Health during the summers of 1899-1902. He has

been an extensive contributor to the medical, technical and scientific press on the subjects of bacteriology of water, ice and air, the purification of sewage and the causation of typhoid fever. His investigations on the purification of Boston sewage, carried on at the Sanitary Research Laboratory, have led to important practical applications at many of the plants in this country and in Canada.

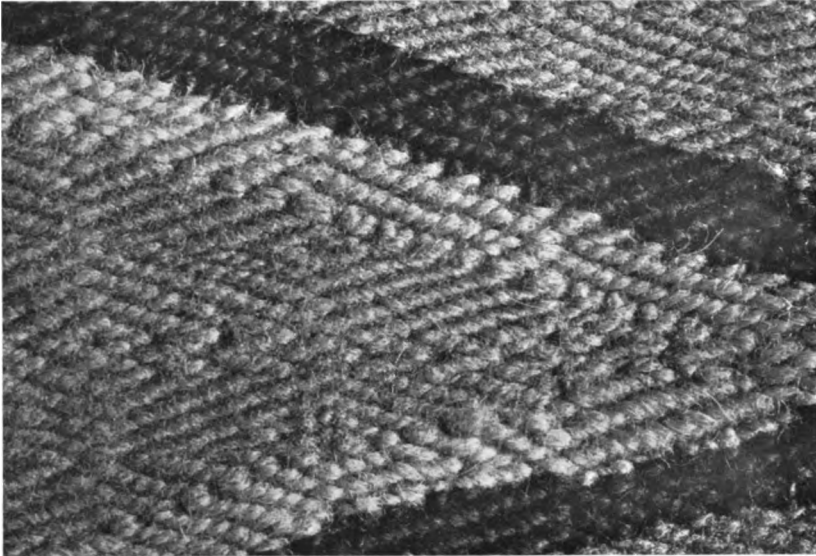
Professor Winslow has been more or less actively associated with socio-



PROFESSOR C-E. A. WINSLOW OF THE DEPARTMENT OF PUBLIC HEALTH

He will build up an exhibit dealing with the problems of New York's water supply and with other sanitary aspects of city life

logical interests in Boston, particularly in relation to movements for better factory conditions and improvements in the milk supply. It was mainly through his efforts that the system of factory inspection in Massachusetts was remodelled two years ago by the creation of district medical inspectors, acting under the Board of Health and having supervision of all questions of factory inspection. In our own section he is already known for his expert services extended in connection with lawsuits relating to the water supply of New Jersey.



SECTION OF A SADDLE BLANKET, LENDERS' COLLECTION

It shows the diagonal or twilled weave conforming to the color design, a white and black diamond on a rose ground

NAVAJO BLANKETS

THE Navajo, the Indian blanket-makers of the Southwest, occupy a large portion of northern Arizona and New Mexico. In language, they are of the Athapaskan stock and therefore are connected with the various Apache tribes to the east and south with whom, in fact, they are able with difficulty to carry on conversation. The Hopi, a Pueblo people, have their homes on the mesas to the west.

The Navajo are the only natives of North America who have become a

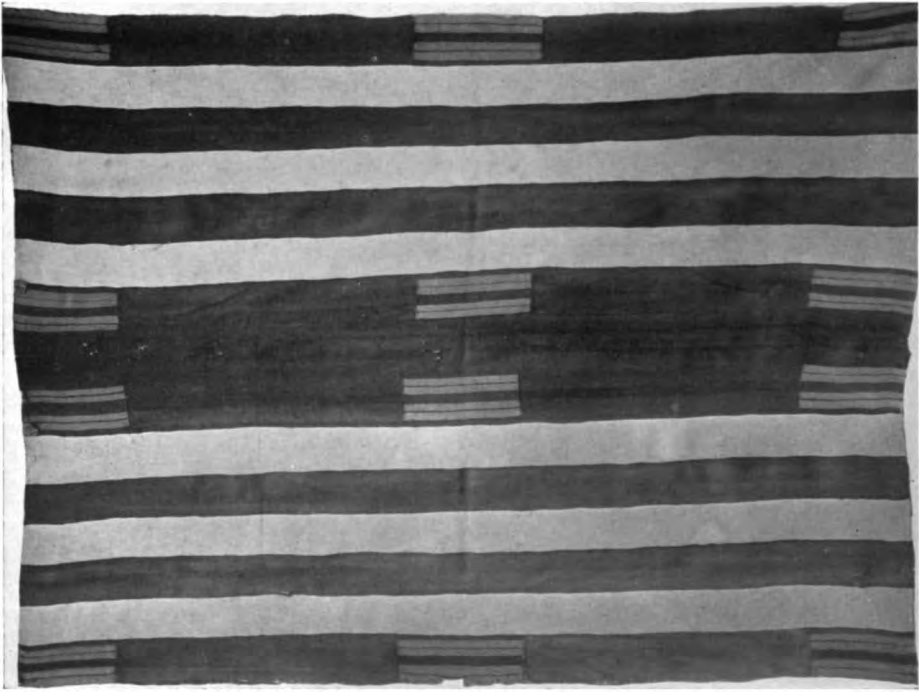
pastoral people. When first visited by the Spanish explorers in 1540, they were already agriculturalists. During the seventeenth, eighteenth and early part of the nineteenth century, the Navajo were given to raiding their Mexican neighbors much after the manner of the Apache. It is probable that at first the mules, burros, cattle and sheep procured on these raids were killed and consumed immediately, but that later they were retained and allowed to breed. The combination of a pastoral and an agricultural life in a semi-arid region requires not only a vast acreage but much traveling. The corn is grown along the stream beds, the crop being matured, if the gods are good, by showers in late summer. The sheep must be moved from range to range as the seasons change. The herding of the flocks usually falls to the children who are assisted in times of difficulty by the older members of the family. Only during the winter is a house really necessary; at other seasons, the family lives under the shelter of a tree or rock. The Navajo have become a wealthy people with their half million of sheep, doubly so since much of the wool, by the skill, industry and unlimited patience of the women, is woven into blankets.

Blanket-making is now the chief art of the Navajo. It seems probable that formerly they made a variety of baskets and that methods of dyeing and the designs were transferred to the blankets as the art of basket-making declined. Many of the men are expert silversmiths showing not only skill but excellent taste. The Navajo are not the unpoetic, unimaginative people they appear, for they have a great wealth of ceremony with songs, prayers, and complicated graphic art.

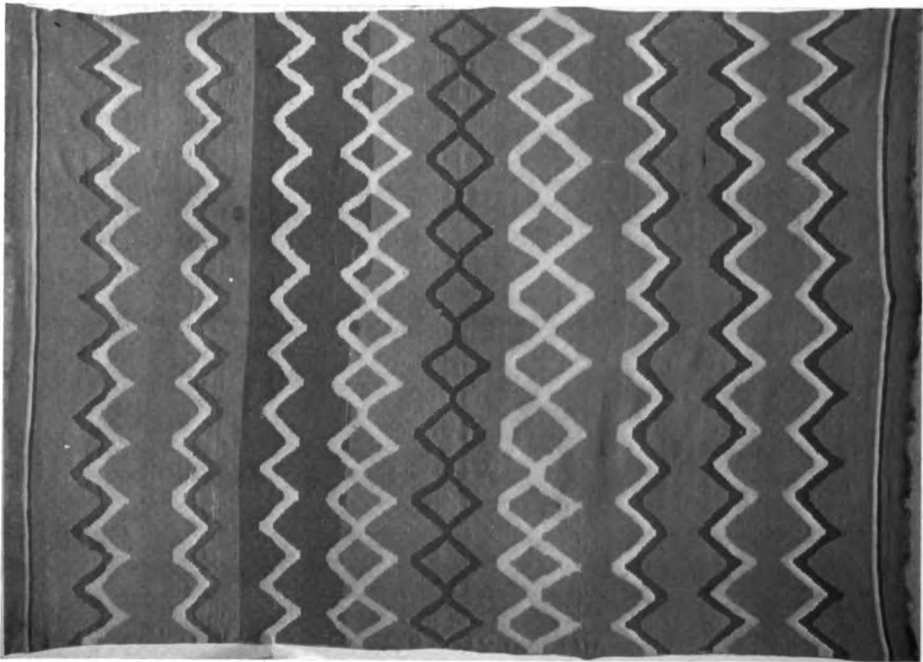
BEGINNINGS IN NAVAJO WEAVING

The history of the Navajo shows the adaptability of a race to meet and take advantage of new conditions and to imitate and develop the customs of neighboring races. It is especially interesting to look at this history in connection with weaving, since the beginning of the manufacture of cloth by any race is always a milestone in development, clothes giving a more emphatic impression of the status of a people than any other one item in their culture. There was considerable weaving done in North America before 1492, the date of the landing of Columbus. From the cliff-dwelling Pueblo area of New Mexico and Arizona southward to Peru, cotton was cultivated, spun and woven into cloth. Specimens recovered from the extremes of this territory indicate that a high state of perfection had been reached. Also in another area, the Northwest, the Chilcat and other tribes made blankets from the hair of the mountain goat, where, however, the





CHIEF'S BLANKET OF THE LENDERS' COLLECTION



THE GEM OF THE LENDERS' COLLECTION

Indigo blue and white design on a body of bayeta red, the bayeta ravelled from five different pieces of cloth

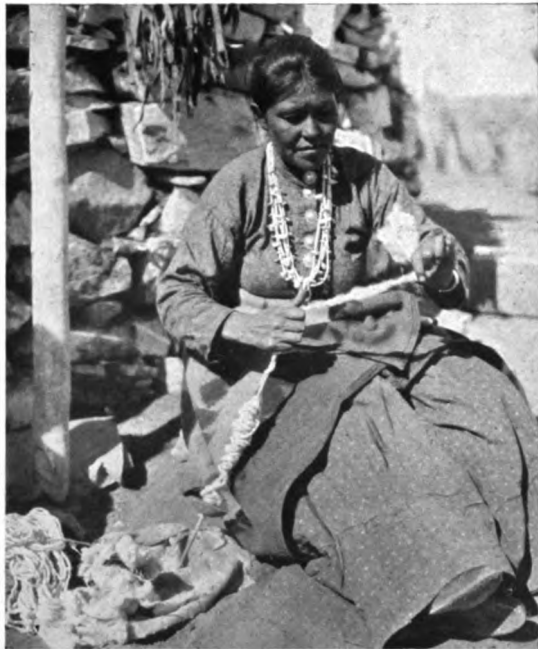
most simple form of loom was used, the work being done entirely by hand as in basketry. Again, in the eastern portion of North America, belts and other small articles were woven from Indian hemp and from buffalo, bear and moose hair. The Navajo, however, in early times, seem not to have raised cotton nor to have woven blankets, although their Indian neighbors, the Hopi, are known to have done so.

METHOD OF WEAVING

The spindles and looms used by the Navajo are so similar to those employed by the Indians of this region and farther south one is justified in supposing that in some respects the art was borrowed, but certainly not from Europeans since the differences are too great to be reconciled with any direct teaching by the Spanish. Judging from the general character of the product and the designs employed, one must believe that to a very great extent, the Navajo have developed for themselves their unsurpassed art.

The wool is sorted, spread out on a sloping stone and then washed by pouring hot water containing an extract of the yucca root over it. The carding is done with a pair of ordinary European hand cards and there is no evidence of a primitive means ever having been employed. The spindle, however, is the same as that found in cliff ruins. It consists of a small stick at the base of which is a wooden disk to give momentum and facilitate the winding of the yarn.

The loom is a simple frame in which the warp is placed vertically. The weaving is done beginning at the bottom, the



NAVAJO WOMAN SPINNING WOOL

The spindle is very like those found in the prehistoric cliff-dwellings in the Southwest



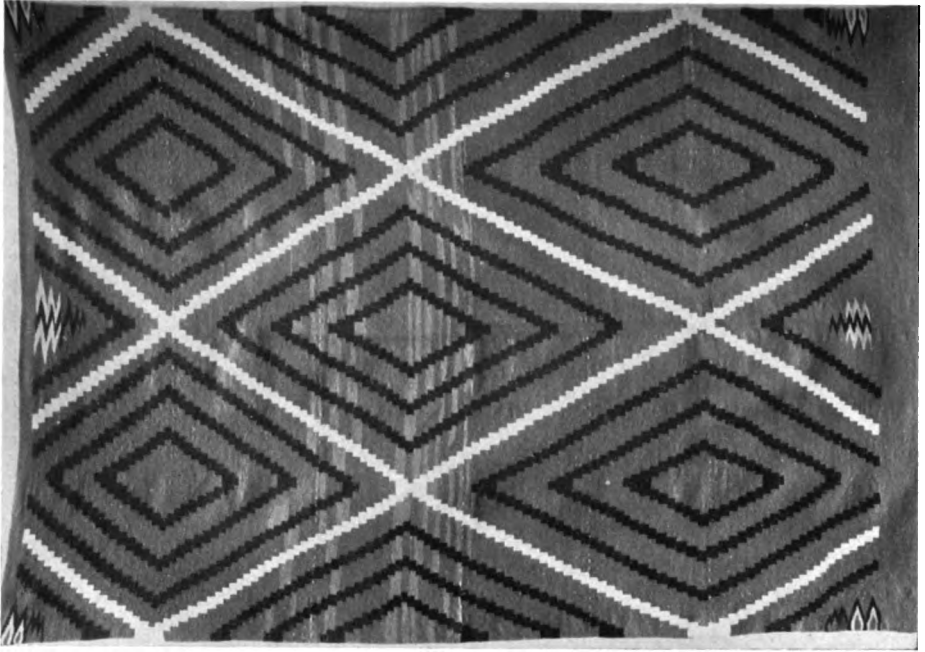
WEAVING A NAVAJO BLANKET

Insuring a close weave by beating down the wool with a batten. Both implement and method are characteristic of the Southwest

blanket being lowered as the work progresses. No shuttle is used, the yarn is inserted with the fingers or by the aid of a small stick. The wool is forced down by pressure with a fork or by the blow of a batten stick. The weaving of North America is peculiar in that the wool strands of a particular color are not carried entirely across the blanket, but only as far as that color is required for the design. It is then dropped and another color taken up.

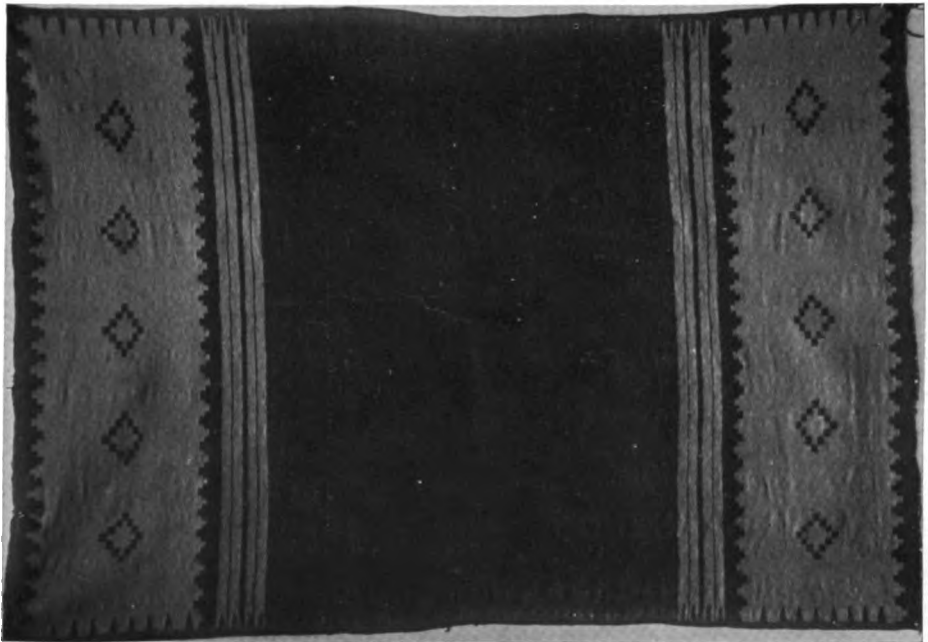
COLORS OF NAVAJO BLANKETS

The colors employed are the natural white and brown of the well-washed wool, a gray which results from the mingling of these, and various native and commercial dyes. Some of these were almost certainly employed by the Navajo in basket-making. Black they produced by combining a concoction of sumac (*Rhus aromatica*), roasted ocher and piñon gum. Dull red was obtained by placing the yarn in a liquid made by boiling in water the bark of alder and mountain mahogany. Lemon yellow was secured by the use of the yellow flowers of the shrubby *Bigelovia graveolens* and a native alum. Old gold resulted from rubbing into the wool a paste made of sorrel roots and crude alum ground together. In rather early days indigo blue was obtained from the Mexicans and displaced native blue. A bright scarlet and a rose color were obtained in the early history of blanket-making by ravelling woolen cloth obtained from Europeans. Blankets containing such material are called "bayeta" from the Spanish name of



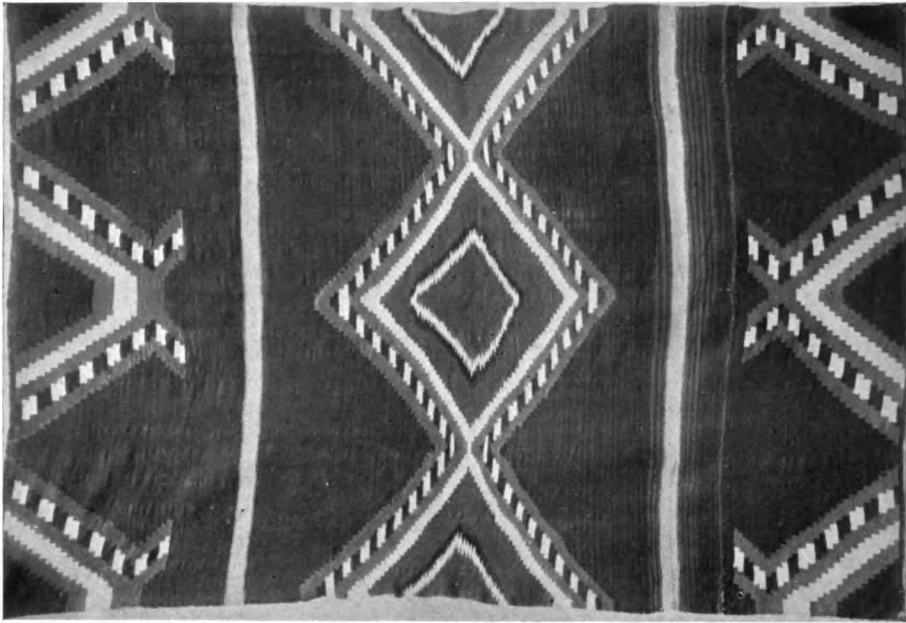
AN ATTRACTIVE BLANKET IN THE SAGE COLLECTION

Background of red, broken in the middle by irregular stripes of lighter color; diamond pattern in dark blue and white



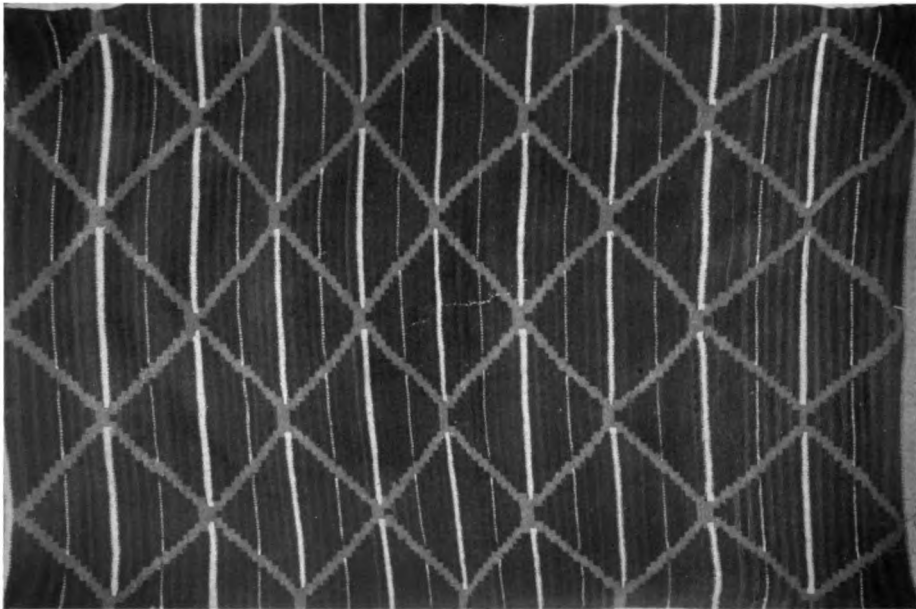
NAVAJO WOMAN'S DRESS

A blanket of black and bayeta red. Sage Collection



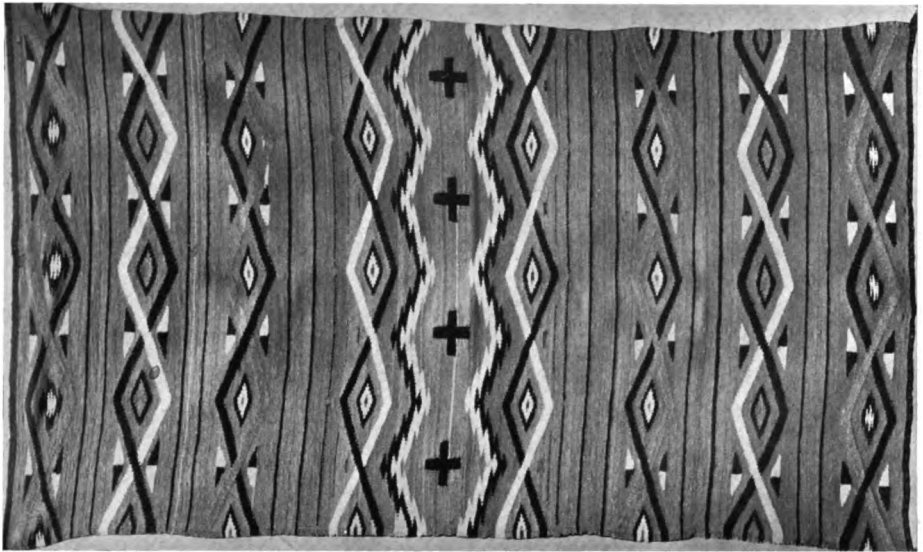
NAVAJO BLANKET OF THE SAGE COLLECTION

Background of blue and black; a diamond in red as a central design; rose colored bands between middle and end figures



A VALUABLE BLANKET, SAGE COLLECTION

A design of red and white on a background made up of narrow blue and black stripes



A BEAUTIFUL SADDLE BLANKET FROM THE SAGE COLLECTION

The background is red, the complicated design dark blue, yellow and white. This blanket is unusually fine in weave



A VALUABLE OLD NAVAJO BLANKET

Designs in white and indigo blue on a background of red. Sage Collection

flannel used in the soldiers' uniforms. It is to be regretted that in recent years aniline dyes have superseded native ones. At the present time an effort is being made by the traders in the Navajo country to secure the use of native dyes again or of more permanent commercial dyes.

NAVAJO DESIGNS

Since blanket weaving is of comparatively recent origin among the Navajo, the source of designs is a matter of considerable interest. It is yet to be determined how far these patterns are a natural growth coördinate with the development of Navajo weaving, in how far they have been taken over from Navajo basketry, and to what extent they have been influenced by Pueblo and Spanish neighbors. The earlier examples of Navajo weaving often have broad stripes, closely resembling the blankets made by the Hopi. Later many geometrical figures appear, standing alone, or combined with horizontal and vertical stripes or with each other. The general arrangement is usually symmetrical, but both the completed pattern and the individual designs lack the exactness of machine work.

The more common designs are squares, parallelograms, diamonds and triangles. Diamonds are often formed by intersecting diagonal lines which run across the blanket, half diamonds resulting at the sides. The outlines of the figures in many cases are broken with right angles, that is, made to consist of a series of steps. These designs have Navajo names descriptive of them, such as "sling" for the elongated diamond, "three points" for the triangle. The ordinary diamond is called "star large," by which the morning star is meant. This and the zigzag line representing lightning and triangular masses called clouds have more or less religious connotation and may be symbolic in their intention. The swastika, a primitive cross-like form, which is now often seen on blankets has recently been introduced in response to the commercial demand for it.

KINDS OF NAVAJO BLANKETS

The Navajo wove at first to secure clothing and blankets for their own use. The women's garment consisted of two rectangular pieces of cloth partly sewed together on the sides and one end, openings being left for the neck and arms. The fashion required that the middle portion of each piece be black with a broad band of red at each end relieved by narrow stripes and small designs in black or blue. This red is in many cases bayeta because the women's dress has not been much worn since the use of bayeta has been superseded by Germantown and commercial dyes. A single large rectangular blanket was used to wrap around the body. These

are called "Chief's blankets" and are distinguished by a peculiar arrangement of designs. The body of the blanket is made in broad stripes. On this as a background, a rectangular design is woven in the center with one half of the same design midway on each side and one quarter of it in each corner. These blankets are valuable because they were woven with care from finely spun yarn and because they usually date from the period of bayeta and the better dyes. The Navajo now prefer to wear the trader's blanket since it is lighter in weight and more gorgeous in colors and designs.

From the collector's and blanket lover's standpoint, there are four groups into which Navajo blankets fall. The most valued are those containing bayeta which have not been made since about 1875. Next stand those which consist entirely of wool in the natural color or dyed only with native dyes. Thirdly, many blankets of excellent workmanship and pleasing designs have been woven from Germantown yarn, ready spun and dyed; and finally, the common modern product too often the result of aniline and other commercial dyes.

NAVAJO BLANKETS RECENTLY ACQUIRED

In the Lenders' collection presented to the Museum by Mr. J. Pierpont Morgan, there are twenty-five Navajo blankets, eleven of which contain bayeta yarn, five of the eleven being also chief's blankets. The gem of this collection is about two yards long and a yard and a half wide and has the body of bayeta red, material ravelled from five different pieces of cloth.

Mrs. Russell Sage during a recent visit to the Southwest and California purchased two collections of blankets. One of these belonged to A. C. Vroman of Pasadena, California, and had been made by him with rare taste and judgment. It is mostly composed of the very best examples of earlier Navajo weaving. Thirteen blankets of this collection were given to this Museum, others to the Metropolitan Museum of Art. The second collection was obtained from Fred Harvey, well-known through his connection with the Santa Fé railroad system. It consists of six Navajo blankets in addition to specimens of Hopi, Chimayo and Saltillo weaving. This collection as a whole has been presented to the Museum.

A few months ago the Museum had no blankets worthy of mention and the situation was a discouraging one, for good blankets are obtained only by bountiful means and by the exercise of a critical judgment acquired through years of experience. These three collections brought into the possession of the Museum through the generosity of Mrs. Russell Sage and Mr. J. Pierpont Morgan have already supplied the need hardest to meet, that of the oldest and best blankets.

PLINY E. GODDARD

"TURNING KOGMOLLIK" FOR SCIENCE

EXPERIENCES OF THE MUSEUM'S ARCTIC EXPEDITION

THERE could be no more simply told story of hardship, of high hopes made futile by storm and illness than that recorded in the latest letters from the Museum's Arctic Expedition. The past winter will long be remembered as the "hard times" winter by the two expedition leaders, Messrs. V. Stefánsson and R. M. Anderson, "turned Kogmollik" in the cause of science — "to turn Kogmollik" meaning to join forces with the Kogmollik Eskimos of the Mackenzie delta and eastward, dressing as they do and wandering with them to get a living from the country.

Any man who goes into the Arctics expects the possibility of having to face starvation, unless he takes a ship. It is impossible to carry with dog team or small boat enough to serve for more than a short journey; and if at the end of the journey, game proves scarce or wandering bands of Eskimos cannot be located, retreat from the difficult situation becomes problematic. In such straits Eskimos sometimes have to sacrifice their dogs; but unless worst comes to worst, they take such an adventure as a matter for joking and with whetted courage push on, perhaps in the face of a blizzard and through deep snows. The explanation of the Eskimo's cheerful view of the matter lies largely in his trust in the hospitality of his fellow Eskimos. For in Eskimo character there has evolved great unselfishness and in Eskimo tribal life a rare communism, passing strange and contradictory as it may seem that this should have taken place in a land of cold and privation, opposed to the selfishness and cruelty of most peoples of southern countries where there are physical comfort and plenty. A chief in the Arctics is not appointed or chosen, nor does he inherit his title. He attains it from a reputation for hospitality.

The Stefánsson-Anderson Expedition differs essentially from ordinary Arctic ventures in that whereas it is usual to carry along everything that the party is expected to need during its stay in the field, in this instance, little in the way of food, clothing or house materials was taken. This was the original plan, since the primary aim of the expedition is ethnological. How can a white man become familiar with the real life of primitive peoples, with their language, folk lore and songs, customs, beliefs and ambitions, except by living with them in their houses and as they do? Therefore, the leaders of the Arctic Expedition dress in Eskimo clothes, which weigh no more than a spring suit yet "allow one to sit comfortably on a block of snow, with back to the wind, fishing through a hole in the ice, the tem-

perature being -50° Farenheit, and to feel the cold nowhere but on the face." They eat Eskimo food also, a great acquirement for a white man, and report that since the first month's difficulties they relish all,—raw frozen fish, eaten as one would eat corn from the cob, boiled fish without salt, taken with the fingers, even the Eskimo delicacy of boiled fish heads, and, of course, seal oil, whale blubber and deer meat.

The necessity of existing on such food seems a bad enough state of affairs to one surrounded by the comforts of civilization, but in reading the letters of the expedition's experiences the past winter the imagination is sated with the recounting of one impossible food after another:

A little Eskimo boy with us was fortunate enough to find the carcass of a caribou which had been killed by wolves. They had eaten only part of the back meat, leaving us enough for three or four good meals....After that was gone we had "whitefish" blubber straight, with the addition of about two spoonfuls apiece of caribou stomach mixed with oil at each meal. Our caribou had carried a peck of well masticated moss and grass in its stomach. Perhaps the stuff did not have much nutritive value for man, but it served as a vehicle for the assimilation of a much greater quantity of oil than we could take straight. I asked the Eskimos to tell me the name of this camping place, as nearly every little creek, hill or promontory has a local name. Nobody knew, but "Jimmy" sardonically suggested that we call it Kak'-wi-ä-tuk (the place of no food).

Ivitkuna killed a fox, which afforded a taste of meat. We also singed the hair off a piece of sealskin, slightly scorching the skin. This made the skin brittle and "chewable" and as a little fat was still adhering it was quite palatable, much better than the scraps of rubbery, raw sealskin we had often forced down our throats before.This diet kept us from experiencing actual hunger, but we felt lazy, and weaker every day. Frequent halts were necessary, perhaps fifteen minutes every hour, and we usually fell asleep sitting on the sled at every halt. Everybody was getting pretty thin, but had not been sick at all. I had lost fully twenty pounds in nine days, although still fairly strong.

The expedition took small equipment in supplies, it is true. Yet scan the list of purchases made at Point Barrow on the Alaskan coast. At first blush the perusal is amusing, later enlightening. Of course, there is ammunition; also, bespeaking the needs of the climate there are deerskin coats and various articles such as snow goggles. Lanterns and cases of coal oil anticipate the Arctic winter when the sun does not rise for nearly three months. Naturally the list itemizes dogs: 4 dogs at \$15 each, 1 dog \$19, 3 dogs \$45. But besides all these there are certain frequently recurring items that arouse interest because of the large amounts: 50 lbs. of tea at 35 cents a lb., 20 lbs. of tea at 20 cents a lb., 40 lbs. of tea at 35 cents, and so on; 4 tins of matches \$8, 3 tins of matches \$6, 2 tins of matches \$4, and so on; 100 lbs. black tobacco \$50, 8 boxes chewing tobacco \$38, 50 lbs. Uncle Ned tobacco \$20, and so on and on. The fact develops that

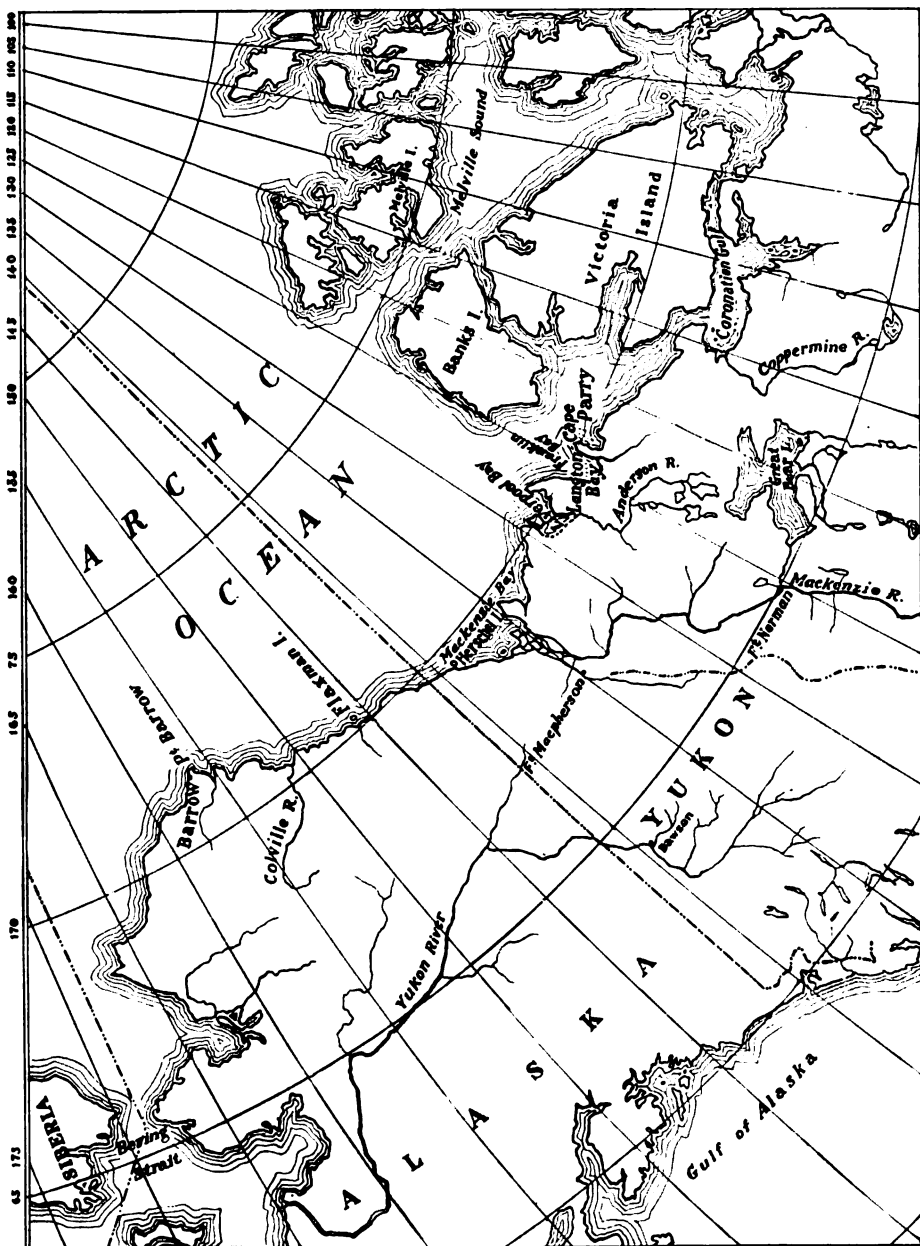
these astounding quantities of matches and tobacco and of tea are not for the members of the expedition, but are to pass slowly into the hands of the Eskimos, being the staple trading medium of the country.

The Arctic Expedition left New York in May, 1908, financed for its work by the American Museum of Natural History and in part by the Geological Survey of the Canadian Government. It proceeded overland to Edmonton, the world's greatest fur market, then two thousand miles northward by the Mackenzie River route to the coast. The final good-by was sent back from Athabasca landing which was the jumping-off place as regarded communication with the Museum. The main object of the expedition is to make a scientific study of little-known Eskimos, especially those tribes east of the Mackenzie River, and to obtain, of course, as much material as possible to illustrate Eskimo life and customs. Secondly, it is to carry on a zoölogical survey, procuring collections of mammals, birds and fish, this work being in the hands of Dr. Anderson.

In the ethnological work there were plans to investigate two fields, one west of the Mackenzie River, the other east. The "Nunatama," an inland tribe of the Colville are probably least known scientifically among the Eskimos of Alaska because they never trade directly with the white man, getting goods from the Point Barrow Eskimos, who in their turn trade with the Arctic whaling vessels. The greatest interest of the expedition, however, centers in the tribes east of the Mackenzie at Coronation Gulf with its Coppermine River and on Victoria Land north of this. It is known that here are opportunities to study tribes wholly uninfluenced by the white race.

Although the desire was to go directly to these eastern Eskimo tribes, the final arrangements sent the expedition west to the Colville with the idea of returning eastward by whaling ship. The latter plan ingloriously miscarried owing to the fact that no whaling vessel visited the region during the whole season, the first time such a thing had occurred during the forty years since ships began to visit there regularly. Thus the expedition was forced to winter in the lower Colville region.

Now it happens that the Colville, which is very poor in game, is not the place one would choose in which to spend a winter. The year before both dogs and Eskimos had starved to death there and many families had moved out. This winter the cold came early, ponds were frozen over in August. The failure of the whaling vessels meant not only inability to get eastward from the Colville but also that the winter must be passed there without sufficient supplies, for only part of the equipment had been taken by way of the Mackenzie, dependence being placed on whaling vessels from San Francisco to get the remainder to the northern camp. The Museum made



MAP TO SHOW THE REGION VISITED BY THE MUSEUM'S ARCTIC EXPEDITION

The expedition spent its first winter, 1908-9, on the Colville west of the Mackenzie, its second in the region of Cape Parry and Langton Bay, east of the Mackenzie. Its important work with Eskimo tribes uninfluenced by the white race is still farther east, on the Coppermine River. Mr. Stefánsson's party started for the Coppermine in April, 1910

repeated and emphatic efforts to get north these supplies. The Museum files show copies of many letters written by Director Hermon C. Bumpus to steam whaling companies, owners of private whalers, captains of freight schooners and of United States revenue cutters, and with these letters courteous responses bearing negative results. Strange chance it seemed that there was no vessel of any sort going to the Far North in the summer of 1909. The negotiations for shipment of supplies went on between the Museum and the West through the winter and early spring. At last it transpired that one steamship whaling company of San Francisco, Messrs. H. Liebes and Company, would send the freight steamer "Herman" to Herschel Island and would carry supplies. That the supplies left San Francisco April 24, 1909, however, did not insure their reaching the expedition, and if the truth must be told, revealing much in regard to Arctic navigation, these same supplies, most of which left New York in the fall of 1908, and all of which left San Francisco in April, 1909, have not yet reached the Museum's expedition or at least had not done so in late spring of 1910 when the last letters were sent out.

The winter on the Colville proved less difficult than had been feared; spring came and the main energies of the summer of 1909 were spent in getting eastward, with much time lost waiting for whalers which never came. Finally Mr. Stefánsson succeeded in getting as far east as Cape Parry, near enough to the Coppermine for a dash there at the opening of the spring of 1910 — if the intervening winter could be successfully passed. It is this winter in the Cape Parry district that has proved the "hard times" winter for the expedition, set forth in the narrative of recent letters.

We landed, Nat-ku-tji-ak, his wife Pan-ni-gáb-luk and I, August 31, by the stranded wreck of the steam whaler "Alexander," lost here in the summer of 1906, ten miles east of Cape Parry. Our first object was to find deer, as we were insufficiently clothed for the winter and had on hand provisions for about two months only. After hunting inland in vain two days, we decided to store most of our stuff in an old house built by some Eskimos who pillaged the "Alexander", and then proceed to Langton Bay to look for deer. We had to transport the things, a little more than a boatload, from where they had been landed on the beach to the house, and while we were loading the second time a southwest wind suddenly blew up. We made a vigorous effort to get to the house, but the beach was rocky there and the surf made a landing impossible. We had to run into shelter in a deep fjord cutting southeast into the land. The southwester continued and we could not get back to the "Alexander," although many articles which we needed badly were there and others a handieap to carry were with us in the boat.

As soon as possible we began edging southwest along the coast, but it was slow work. Paddling a big umiak is slow work under any conditions for three people. A few days of southwest gales would be separated from a few more days of southwest gales by perhaps a half day of calm, but never a breath of fair or land wind. Unfortunately for us we happened to have with us a map of the coast. When on

September 7 we came to a bight in the shoreline which corresponds excellently with one on the map into which the map makers show that a large river empties, we concluded we had reached this river, R. la Roncière. The formation of the coast simulated well the mouth of a large river. We all agreed that the river must have trees, or at least large willows, as all good-sized rivers do, which would mean game, and it seemed advisable to ascend it. The beach was covered with small spruce drift trees which promised well. I made an entry in my diary to the effect that "R. la Roncière" differed from most Arctic rivers in that the Lord had put it in the same place as had pleased the map makers.

We ascended and found, sure enough, a river — small, it is true, but we took it for one of the numerous delta channels of a large stream. We went for about five miles farther and came to a small lake. We know now that "R. la Roncière" does not exist. It took us two days of fair weather to get back to the open sea again, and we finally reached Langton Bay September 13.

At Langton Bay, Mr. Stefánsson and the Eskimos hunted with little success. This was unfortunate because all were short of deerskins. Each person in the Arctics needs at least six deerskins for clothes and three for bedding; in fact a total of nine skins is rather short allowance. By the end of October, considerable anxiety began to be felt concerning the whereabouts of Dr. Anderson who in August had started east in a small boat along the coast, leaving at Herschel Island, boxed and ready for shipment, all specimens collected up to that date. Eventually Mr. Stefánsson and his Eskimo started out to find him, first building a log house with an open fireplace where the Eskimo woman could stay to protect a cache of twenty-two deer. Travelling was difficult but they reached the coast fifty miles west from Langton Bay by November 18. Here they found on the beach an old whale carcass, probably four years old, and spent a day getting a sled-load of blubber before proceeding. They had gone on only a day's journey when they were rejoiced to meet Dr. Anderson with his six Eskimo assistants. The whole party returned to the beach where the frozen whale was and spent the day getting another load of blubber and in talking over the situation.

Dr. Anderson had been traveling under unusual difficulties because having a large party of assistants to make possible the transportation of supplies and collecting equipment. He says respecting this, "Turning Kogmollik has its disadvantages as well as its advantages. Alone I could shoot more game than I drew out of the pot and still have much leisure time for other work. There was certain work to be done, however, which I could not handle alone and diplomatic reasons compelled me to become a communist out and out. This meant a hand to mouth existence for a time with so many to be fed, some worry, and much hard work, but brought my boat and goods to the place where they had to be."

The matter of assistants in the Arctics is a large problem. To hire an

Eskimo means that his family also must be fed and carried along with the expedition. Captain Roald Amundsen is of the opinion that outside of the scientific staff of an expedition Eskimos should best be depended on for all work, his chief reason being not the greater resistance of the Eskimo physically to northern hardships, although that is true also, but that the Eskimo does not get homesick and is not continually down-hearted. The Eskimo's disposition is such that whether he be cold, hungry or in danger he seldom becomes dispirited or sulky. Commander Peary has always spoken in favor of Eskimo assistants and has always shown his personal preference in being accompanied by them on his dashes for the Pole. Mr. Stefánsson who had previously spent a year with the uncivilized Eskimo agreed with this opinion in favor of the Eskimo and the Museum's Arctic Expedition was planned accordingly. He reports, however, a wonderful change in the Eskimos as regards pay for services since he was at the Mackenzie delta in 1906. "Then they knew little about money and one could hardly pay for anything. He might make gifts, but pay was never asked and if offered needed explaining by the statement that white men always pay for food and work in their own country. So great is the change that now an Eskimo seldom remains permanently satisfied with the most liberal pay for services."

While the reunited divisions of the expedition worked getting a store of blubber, the leaders reviewed the past and carefully studied the future. One thing was certain, they must have the traps and ammunition that had been left perforce in the old house beside the wrecked "Alexander." Black and silver fox had recently been seen, black fox with a value from six hundred to a thousand dollars per skin. Besides there could be no more opportune time to get the things necessary for the Coppermine trip which would begin in the spring as soon as the sun came back. It was, therefore, decided that Dr. Anderson with two Eskimos and ten dogs should go at once to the "Alexander." The day they separated was one of the worst of the year,—35° with a southwest blizzard. Going east with the storm, Dr. Anderson could proceed; going toward the west and so in the face of the gale, Mr. Stefánsson's dogs refused to work, and waiting was necessary till the storm abated. At last they started, six people with two days' provisions, and after fifteen days of struggle they got back to the log house where they had left the Eskimo woman in charge of the cache. Nothing could be more graphic than Mr. Stefánsson's description of these fifteen days:

On the whole trip we killed five ptarmigan and not a single rabbit, though one of us hunted each bank all the way up. The sun was gone and so the daylight was meagre, besides it blew a blizzard every day. The whale tongue was very bad eating,

it had little to it but dry fibres and was strongly impregnated with sea salts (other than NaCl). When we had finished this we were really better off for the stuff seemed to make us sick. We then ate sealskin, some deerskin we had along for sole leather and our snowshoe lashings, in fact every edible thing except clothes. Fortunately we had seal oil. With about a cupful of oil a day one does not feel in the least hungry but lazy, sleepy and weak. All of us found it a little difficult to take the oil straight. We soaked it up in tea leaves, deerskin with long hair on it and ptarmigan feathers.

Before they reached the end of these fifteen days some of the Eskimos were taken sick, and did not recover for weeks. These were indeed most discouraging times. Mr. Stefánsson was not able to go far from the camp because of the sick Eskimos, there were seven people and six dogs to feed, meaning a consumption of rather more than a deer per day, while there was no light but dim twilight for hunting, and every southeast wind brought fog, every southwest wind, a blizzard. To add to other causes for depression all were feeding wholly on lean meat in Arctic cold where health and spirits depend on the presence of fat in the food. Also it was at this time that the oil for lights gave out:

At this time we had left only about a quart of oil, which was soon gone and we were without lamplight all the time the sun was away. This was especially inconvenient for the women, as sewing in the dark is difficult. There was more than once a whole week, too, when I made no entry in my diary because I could not see. One could write for about two hours at noon, but I was usually hunting at that time, always starting out before daybreak.

In addition, we were getting badly worried over the non-arrival of Anderson and his party. They should have been home by Christmas. We were especially afraid that on the very day they left us in the blizzard they might have ventured too far off shore on the ice and have been carried with it to sea. The sick Eskimos were growing despondent. I used to see deer almost every clear day (there was fog or blizzard two days out of three) but on the clear days it was so absolutely breathlessly calm that deer could hear you and you could hear them from a quarter to a half mile away. I therefore never got a shot at them. An Eskimo always looks upon such protracted ill luck as caused supernaturally. Taboos had been violated. They knew I had eaten deermeat the day I killed a wolf, but worse than that they knew of more than one case of my breaking the Sabbath. They were therefore certain they should never be able to get any deer. One day, however, I shot a fawn. This seemed to break the spell to the notion of the Eskimos.

In early January lack of food made some sort of a venture necessary, so a start was made for Langton Bay. Here they found the cache of blubber broken into by a wolverine which had eaten a hole through a two-inch plank. Small consolation was gained by the fact that they caught the wolverine, although it was excellent eating after its high living on deer meat and bear meat. Disappointed here, there was nothing to do but keep on to the "Alexander"; reaching the old house by the wreck they

were astounded to find Dr. Anderson and one of his Eskimos there, recovering from pneumonia. Fortunately flour had been among the supplies left at the house or the men never could have lived through. Fortunately too, polar bears have no appetite for flour. When Dr. Anderson arrived at the house he found that bears had broken in and devoured four boxes (500 lbs.) of whale blubber, two slabs of bacon, spilled a ten-gallon can of alcohol and "knocked things about generally"; but the flour they had not disturbed.

The letters report that in March all were "in fit condition, showing no serious after-effects," and that Mr. Stefánsson was expecting to start with his party during the first week in April for the Coppermine.

The expedition is planning to come out of the field soon, and great interest at the Museum attaches to the time when the full results of the work will be known. Making a zoölogical survey in the Arctics is a peculiarly difficult task due largely to problems of transportation of outfit and accumulating specimens; and the collections with duplicate series which the expedition reports will be of great scientific value. With the close of this expedition, Mr. Stefánsson will have five years' knowledge of the Eskimo. He has accomplished much in getting records of songs and short tales, working to ascertain definitely the presence and variations of certain folk tales throughout the tribes. He has complete lists of words used by the Shamans in ceremonials; and he has a large series of head measurements and many photographs. All results of the expedition will possess unusual value, representing as they do, work accomplished in spite of the almost insuperable obstacles set by the Arctic winter and by the necessity of "turning Kogmollik."

MUSEUM NEWS NOTES

THE near future promises rapid development in the Museum's instruction for the blind owing to the Jonathan Thorne Memorial Fund. The work is under the supervision of the Department of Public Education which has long had an interest in Museum instruction for the blind, but outside of its regular lecture courses could do little because all permanent exhibits are of necessity within glass cases. It is hoped that future plans will allow close coöperation with the teachers of the blind throughout the city and that the unusual advantages which the Museum can give in the free handling of duplicate specimens from its store-rooms will be found valuable training for blind children. It is desired even that the Museum

shall extend the work beyond its own doors, sending out to the blind study collections well labeled in both New York Point and American Braille, following here the plan of small travelling museums employed in coöperation with the city schools where 900,000 children were reached during the past year.

AN expedition under Mr. Walter Granger of the Department of Vertebrate Palæontology in searching for fossil remains in the Big Horn Valley, Wyoming, has discovered in the Lower Eocene a complete skeleton of the ancestral horse, a small four-toed species. The skeleton has been taken up in a block of sandstone, and after the block arrives at the Museum, chipping the rock away from about the bones will proceed at once. The great fact is that this skeleton was found in the Lower Eocene, being the first record for this formation, which is older than any that has before yielded a complete horse skeleton. The specimen must, therefore, carry evolutionary history farther into the past than skeletons previously obtained, and when fully exposed, is likely to be found approximating more nearly a hypothetical five-toed ancestor of all horses.

A TEACHERS' DAY has been planned by the Museum authorities. Delegates from all the schools have been invited to be present on Saturday, November 5, from two to five-thirty o'clock. Special guides will be on hand to conduct the teachers through the exhibition halls and especially through the laboratories and workrooms which are not open to the public. The program includes ten-minute illustrated talks by the Curators of the Museum and a general meeting at which brief addresses will be made by Professor Henry Fairfield Osborn, President of the Board of Trustees, Dr. William H. Maxwell, Superintendent of the Public Schools, and other educators. A reception will follow these addresses.

THE HORTICULTURAL SOCIETY OF NEW YORK will hold its fall exhibition in the Museum from November 9 to 13. The exhibition will be open especially for the members of the Society and for Museum and affiliated organizations on Wednesday evening from 7 to 10 o'clock. It will be open to the general public on Thursday, Friday and Saturday from 9 A. M. to 5 P. M. and from 7 to 10 P. M., also on Sunday from 1 to 5 P. M.

MISS MARY LOIS KISSELL of the Department of Anthropology left New York October 28 for an extended period of field observation among some of the Indian tribes of the Southwest. Miss Kissell will devote her time to a study of the basket work and textiles of these tribes paying especial attention to the origin and significance of designs.

DR. R. BROOM, the leading authority on the Permian vertebrates of South Africa and collecting there for this Museum, has recently announced the discovery of a fossil skeleton of *Delphinognathus*, a large and aberrantly specialized extinct reptile, related to the group of Theriodonts. These latter forms are believed to stand rather near the borderland between reptiles and mammals. The accession is important because there is very little South African material in the Museum.

THE SEVENTEENTH CONGRESS OF AMERICANISTS in accordance with an adjournment taken in Buenos Aires in May reassembled in Mexico City, September 7 and continued its sessions until September 14. These congresses meet biennially, alternating between Europe and America. This meeting of the Congress in reality formed a part of the Mexican centennial which continued throughout the month of September. The papers presented dealt for the most part with various subjects concerning Mexican archæology and ethnology and were read by leading anthropologists. Europe was represented by Dr. Edward Seler, Berlin, the president of the Congress; Dr. Francois Heger, Vienna; Professor Capitan, Paris; and Professor Moguel, Madrid. From the United States there were in attendance, Drs. Dixon and Tozzer of Harvard, Dr. MacCurdy of Yale, Dr. Boas of Columbia, Dr. Gordon of Philadelphia, Dr. Hrdlicka of Washington, Professor Starr of Chicago and Mr. Stansbury Hagar of New York. Drs. Goddard and Spinden were delegates from the American Museum.

PUBLIC meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum according to the usual schedule. Programmes of meetings are published in the weekly *Bulletin* of the Academy.

LECTURE ANNOUNCEMENTS

MEMBERS' COURSE

The first course of illustrated lectures for the season 1910-1911 to Members of the Museum and to persons holding complimentary tickets presented to them by Members will be given in November and December.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

November 17 — PROF. CHARLES-EDWARD AMORY WINSLOW, "Insect-Carriers of Disease."

Professor Winslow has been engaged for some years in the study of problems of water supply, sewage disposal and other phases of municipal sanitation. His lecture

will deal with the important discoveries made during the last decade in connection with the spread of typhoid fever, malaria and yellow fever through the agency of flies and mosquitoes and with the recent achievements of sanitation in controlling these diseases.

December 1 — MR. FRANK M. CHAPMAN, "From Sea-level to Snow-line in Vera Cruz, Mexico: A Study of the Distribution of Bird-life as it is Controlled by Altitude."

Mr. Chapman worked on Mt. Orizaba from the coastal lagoons (where moving pictures were secured of the rare roseate spoonbill) and the luxuriant forests of the lowlands upward to the magnificent pine and spruce forests with their snowbirds and crossbills, characteristic of the Canadian zone.

December 8 — MR. JAMES L. CLARK, "Snap Shots from British East Africa."

Mr. Clark, a successful sculptor and taxidermist, has returned recently from a fourteen months' stay in British East Africa. While there he obtained a splendid series of pictures of the big game of the country, as well as of the picturesque natives, and besides had some most unusual adventures, for example, at one time he was treed by a herd of two hundred elephants.

December 15 — DR. PLINY E. GODDARD, "Nomadics of the Southwest."

Through the generosity of Mr. Archer M. Huntington, the Museum for the past two years has been maintaining expeditions in the Southwest for the purpose of making an exhaustive study of the Indian tribes there and of their relationships. Dr. Goddard has spent several months among these Indians, and will give an account of his experiences and observations.

December 22 — MR. ROY C. ANDREWS. Subject to be announced.

Mr. Andrews of the Museum staff has recently spent six months at the whaling stations on the eastern coast of Japan and has secured a number of large whale skeletons for the Museum. Many of his photographs are remarkable.

PUPILS' COURSE

These lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on presentation of Membership tickets. Lectures begin at 4 P. M.

	Oct.	Nov.	
Monday,	24	14	— "New York City: Past and Present." By MR. ROY W. MINER.
Wednesday,	26	16	— "Insects and Health." By PROF. C-E. A. WINSLOW.
Friday,	28	18	— "Forests and their Uses." By MRS. A. L. ROESLER.
Monday,	31	21	— "Scenes in Peru, Bolivia and Brazil." By DR. LOUIS HUSSAKOF.

Nov.

Wednesday, 2 30 — "Alaska and its Indians." By MR. HARLAN I. SMITH.

Dec.

Friday, 4 2 — "Children of all Nations." By MRS. A. L. ROESLER.

Monday, 7 5 — "Transportation: Past and Present." By MR. WALTER GRANGER.

Wednesday, 9 7 — "A Trip to Europe." By DR. LOUIS HUSSAKOF.

Friday, 11 9 — "Life on the Plains." By MR. BARNUM BROWN.

PEOPLES' COURSE

Given in coöperation with the City Department of Education.

Tuesday evenings at 8 : 15 o'clock. Doors open at 7 : 30. Illustrated.

November 1 — "Naples: Its Environs and Vesuvius." By MR. ARTHUR STANLEY RIGGS.

November 8 — "Southeastern Italy: The Sorrentine Peninsula and its Place in History." By MR. ARTHUR STANLEY RIGGS.

November 15 — "Twentieth Century Sicily: The Modern Garden of Eden." By MR. ARTHUR STANLEY RIGGS.

November 22 — Subject and lecturer to be announced.

November 29 — "Holland's War with the Sea." By JAMES H. GORE, LL. D.

Saturday evenings at 8 : 15 o'clock. Doors open at 7 : 30. Illustrated.

November 5 — "The Humming Bird's History." PROF. S. C. SCHMUCKER.

November 12 — "The Mind of the Apes." PROF. S. C. SCHMUCKER.

November 19 — "The Living and the Non-living." By MR. BENJAMIN C. GRUENBERG.

November 26 — "Life Aggressive: Utilizing the Environment." By MR. BENJAMIN C. GRUENBERG.

The American Museum Journal

MARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,	} <i>Advisory Board.</i>
LOUIS P. GRATACAP,	
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THE CHIEF DIRECTS THE CEREMONY FROM THE STERN OF THE CANOE

Every article of dress and regalia from the smallest ivory ornament to the largest ceremonial robe is reproduced in durable materials and with fidelity to nature

—"Work on the Ceremonial Canoe." page 238

The American Museum Journal

VOL. X

DECEMBER, 1910

No. 8

HERCULEAN TASK IN MUSEUM EXHIBITION

FOREWORD REGARDING THE CEREMONIAL CANOE SCENE IN THE NORTH PACIFIC HALL

Photographs from the North Pacific Coast by Lieutenant George T. Emmons,
Museum photographs by Thomas Lunt

AN unusually large task in exhibition entered upon by the Museum is that of filling a Ceremonial Haida Canoe sixty-four and a half feet long with Indian figures, about forty in all, representative in physique, garb and action of the tribes of the North Pacific Coast. The conception is that of Director Hermon C. Bumpus, supervision of scientific details is under Lieutenant George T. Emmons, and the technical work is being carried out by the sculptor, Sigurd Neandross.

Lieutenant Emmons has spent some thirty years among the Indians of the Northwest Coast, working with deep interest along the lines covering their culture and is abundantly equipped in knowledge. The Museum will always be in his debt for invaluable service. Sigurd Neandross is an American sculptor of Norwegian parentage who has been honored at home and abroad. Notable among his works are a monument in the public square in Copenhagen — an imaginative figure of a nymph singing the song of the Vikings, a bust of a mother and child shown at the Berlin International in 1897 and now in the Kaiser Wilhelm Museum at Krefeld, Germany, and in this country a bronze statue of an officer of volunteers in the public square at Pottsville, Pennsylvania. Mr. Neandross has at present several large idealistic figures and groups in progress.

The Ceremonial Haida Canoe was made many years ago on the Skeena River near Port Essington on the Alaskan Coast and formed a part of the Powell collection secured by the Museum in 1883. The monstrous boat hung for many years from the ceiling of the hall, taking its present place in 1908. In this year decision was made to convert it into a great open exhibition case in which to set forth the primitive culture of the Northwest Coast Indians, and the idea advanced by Lieutenant Emmons was accepted that the exact expression of the exhibition should take the form of an institution known as the "potlatch," a ceremonial allowing attractive use of the rich Northwest Coast materials in the possession of the Museum.



SKETCH MODEL IN CLAY

Work was begun in the summer of 1908. The time represented by the scene is somewhat over a century ago when these Indians first came in contact with Europeans. The canoe is supposed to have reached the surf of the beach, being kept in position there by the paddlers holding water and the bow and stern men operating the poles while ceremonial speeches and dances are rehearsed. The result of the positions chosen for paddlers and polemen is not only an artistic one but gives opportunity for mechanically bracing the boat so that there can be no vibration of the exhibit, the poles being anchored in the floor and the paddles riveted in the cement base supporting the canoe.

Mr. Neandross has taken hold of the Museum's problem with unusual insight into the needs of the case, designing an immense composition with sweep and balance in the grouping, yet each figure an accurate study of tribe, suited in dress and action to its particular part in the meaning of the whole. The ideal of exhibition in a people's museum must be accuracy and completeness of truth in such combination with beauty, life and action that there is produced a resultant of human interest and educational force. Mr. Neandross has proved in his work as a sculptor before the world that he is on the way to mastery of a combination in art unusual and difficult, that is of realism and idealism. It is this power of the sculptor which is in considerable part bringing success to the Museum's giant task.

M. C. D.

The actual story of the great canoe's journey to New York is as follows: It was paddled by Haida Indians to Victoria; carried by schooner to Port Townsend, Puget Sound; by steamer to San Francisco; by Pacific mail steamer to Panama; across the Isthmus on the Panama Railroad from Panama to Colón, whence it was shipped on the deck of a Pacific mail steamer to New York. In crossing the Isthmus, to avoid injury during sharp turns, the canoe was adjusted on two platform cars, being fastened securely on the forward car and swinging loosely on greased guys on the rear car. Free transportation from San Francisco to New York was contributed by the President of the Pacific Mail Steamship Company.



A SUGGESTION OF THE PLAN

THE POTLATCH OF THE NORTH PACIFIC COAST

By Lieutenant George T. Emmons

THE potlatch is the distinctive feature of aboriginal life along the North Pacific Coast from the Strait of Fuca to the vicinity of Mt. St. Elias. It is the great giving ceremony when individ-

uals and families gladly impoverish themselves that the dead may be honored, the emblem of the clan exalted and social standing recognized or increased.

What was probably a simple feast for the dead in primitive days, in the progress of time has become a most complex observance which however is regulated by the strictest laws of etiquette and though varying somewhat in minor details among different tribes is recognized in the main by all.



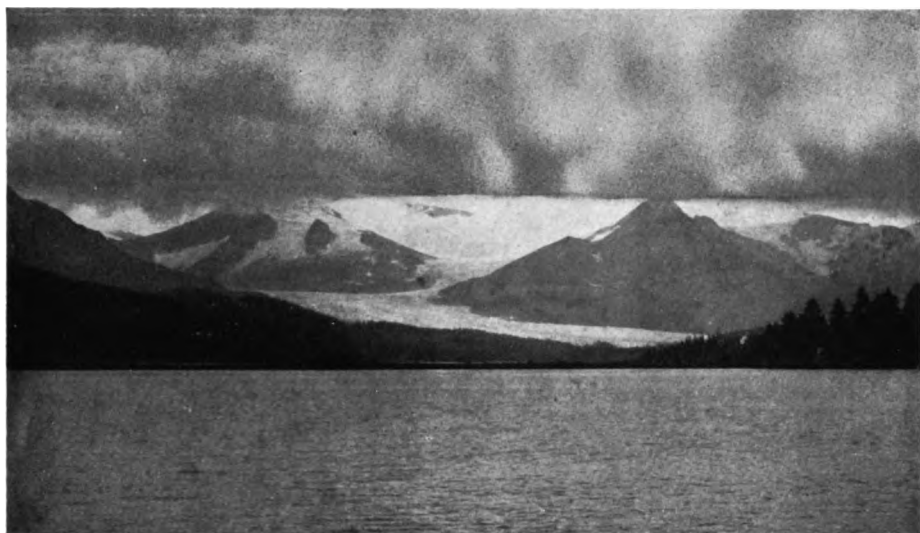
OF THE TLINGIT RACE

Underlying the potlatch as a social function is a deep religious fervor in the worship of ancestry and the communion with the dead

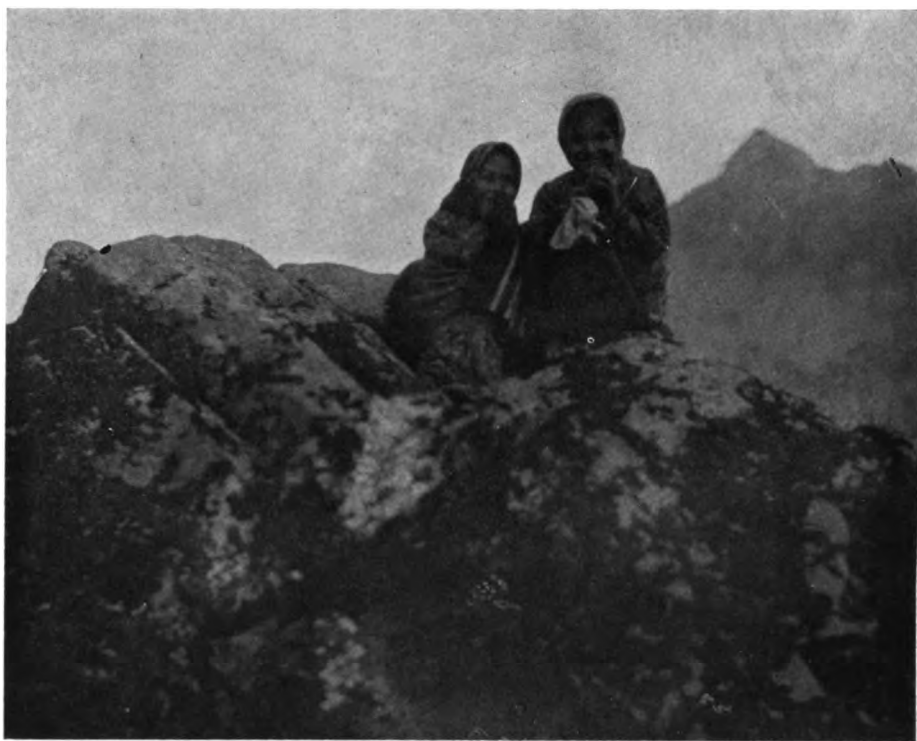
The social organization of the Tlingit is founded upon matriarchy and consists of a number of clans or totemic families grouped under two exogamous phratries which intermarry and supplement each other upon all occasions of ceremony. In the building of the home, the erection of the heraldic or mortuary column (totem pole), the preparation and cremation of the dead, and the mutilations of the body, the service is invariably performed by those of the opposite party, and the potlatch is given in payment for these acts; but underlying the more social function is a deep religious fervor in the worship of ancestry and the communion with the dead. The food and tobacco that are cast into the fire become a spiritual administration to those who are ever present though invisible, and with each offering there is called the name of one departed who receives honor in proportion the gift.

The peculiar food and climatic conditions throughout this area have not only rendered this wholesale giving possible but also have encouraged its practice and development to an enormous degree. Here life is comparatively easy. The wonderful annual run of salmon, trout, herring and eulichon, the steady supply of halibut, cod, whale, seal and shell fish, the generous yield of berries, roots and green things, as well as the great forests of cedar, spruce and hemlock, and pure water ever at hand, combine to offer the greatest advantages with the least exertion. Along this Pacific coast there are but two seasons. During the milder and pleasanter period from April until October the food supply is procured, and the remainder of the year, not extreme in temperature but wet and stormy, becomes a time of leisure. These leisure months from October till May are devoted to social pleasures and ceremonies among which the potlatch holds the first place.

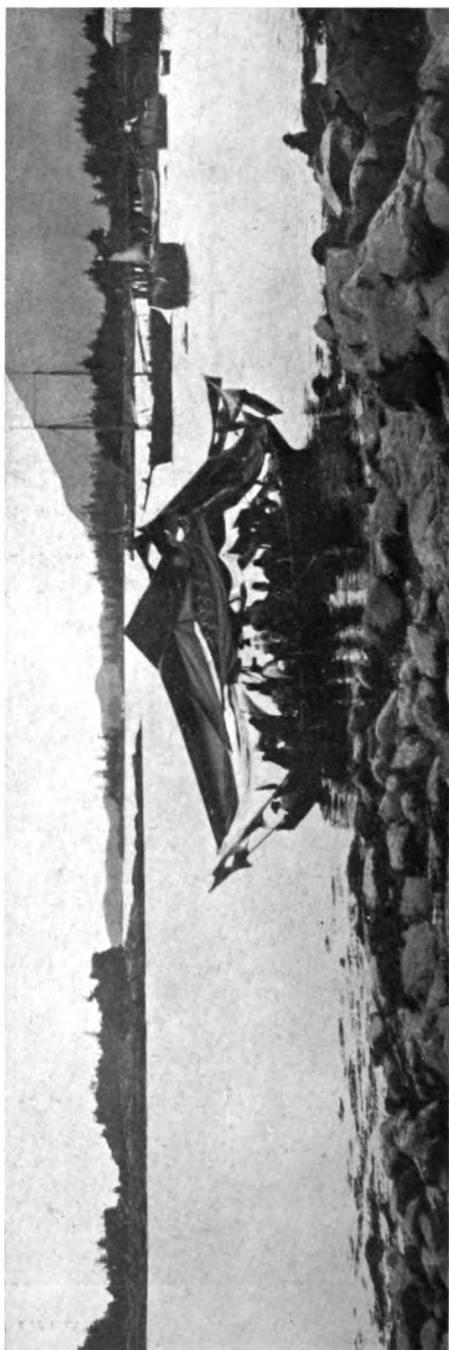
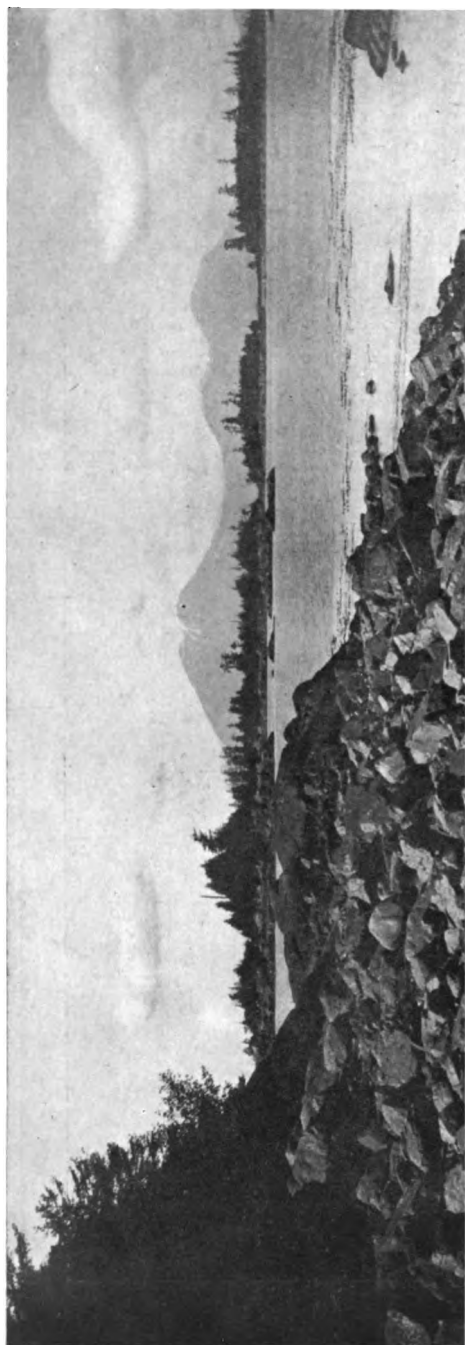
Preparations for the function may occupy much of a lifetime in the accumulation of material to be given away, and the invitations are personally delivered months or a year in advance. The guests, including generally two tribes or village clans, if living at a distance get ready as soon as they return from the summer camps. The canoes are repainted and decorated, dancing paraphernalia is unpacked and gone over, a sufficient food supply for the travel is put aside, and a programme of dances and songs with which to honor their host is arranged. Households embark together in the largest canoes and as in war parties they are under the direct supervision of their chief. They travel and camp together and practice their dances and songs en route. From time to time the host receives notification of their progress and when they are within one camp of their destination, he sends out envoys and food to them. The final day when they embark, the canoes are assigned their places with the chief leading. The men and women



IN THE LAND OF THE POTLATCH



TLINGIT CHILDREN



Sitka is now connected by an all-American cable with Seattle. This is but one indication of the rapid advances civilization is making on the North Pacific Coast and of the changes that are taking place in the culture of the Indian tribes there



SIGURD NEANDROSS, SCULPTOR

have put on their ceremonial dress, the face has been painted and the hair dressed with red ocher and birds' down. With drum, rattle and dance staff they take their places in the sterns of the canoes which now follow each other in column until near the village of their host when they form in line abreast and holding gunwale to gunwale stand in slowly to the shore, the occupants singing and dancing to the accompaniment of the drum. When nearing the beach those paddling hold water, the bow and stern men get out the poles and the line of boats is kept in position, while speeches are exchanged through several hours. With the signal to land the canoes are backed around stern first and beached, the villagers rush into the water to greet their friends and carry the party's belongings to the house which has been prepared for reception and all is confusion and bustle.

In early days the Tlingits had many slaves who paddled the war canoes besides performing all work for their masters. They were not permitted to take part in the ceremonies and were often sacrificed upon the occasion of the potlatch. The group which Mr. Neandross is so skillfully executing represents a Chilcat chief and his followers in ceremonial dress in the war canoe just before landing to attend a potlatch. The dress and materials represented on the figures are all from the North Pacific Coast and in the possession of the American Museum.



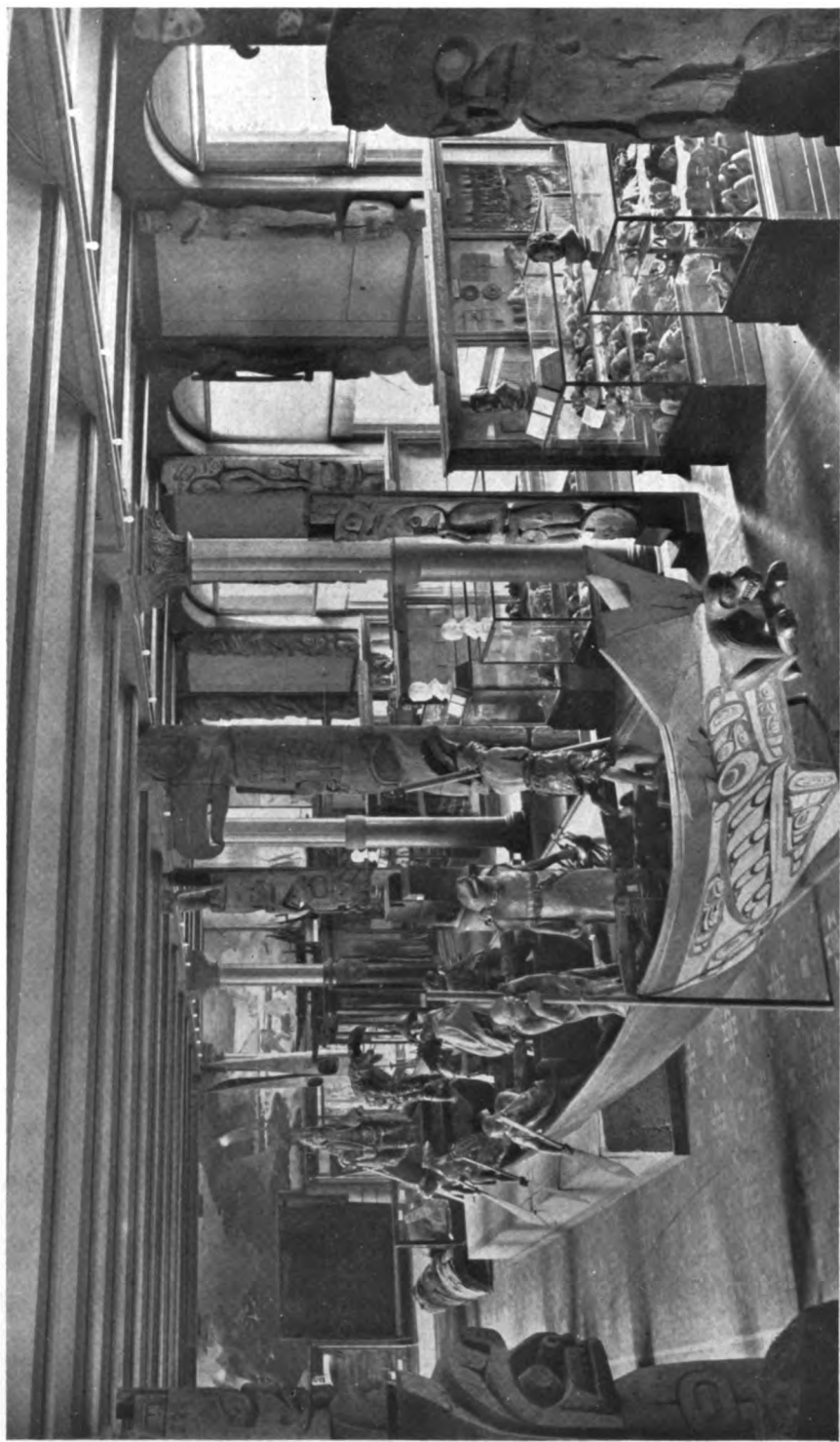
SUCH IS THE COUNTRY OF THE TLINGIT INDIANS



**A POLEMAN IN THE CEREMONIAL CANOE, SHOWING THE SCULPTOR'S
SKILL IN MAKING CASTS OF FIGURES IN ACTION**



The Haida Canoe is more than sixty-four feet long. It came into the possession of the Museum in 1883



The general plan and the decorative features are the conception of Director Hermon C. Bumpus: Stokes Eskimo paintings on the wall at the far end, mural canvases of North Pacific Indians in preparation by Will S. Taylor to take position in the spaces between the windows at right and left, totem poles set to form sections representative of the various tribes, the great ceremonial canoe in the center. The arrangement of the technical exhibits in the cases is the work of Harlan I. Smith, Associate Curator in the Department of Anthropology

THE WORK ON THE CEREMONIAL CANOE

A MODIFIED METHOD OF MAKING PLASTER CASTS FROM LIFE

By *Sigurd Neandross*

THE Museum is continually carrying on experiments to find methods for reproducing objects which cannot in themselves, because of the very nature of the case, be exhibited, and when the work was started upon the Ceremonial Canoe Scene of the Chilcat Indians it was found that the earlier methods of cast taking were not entirely satisfactory.

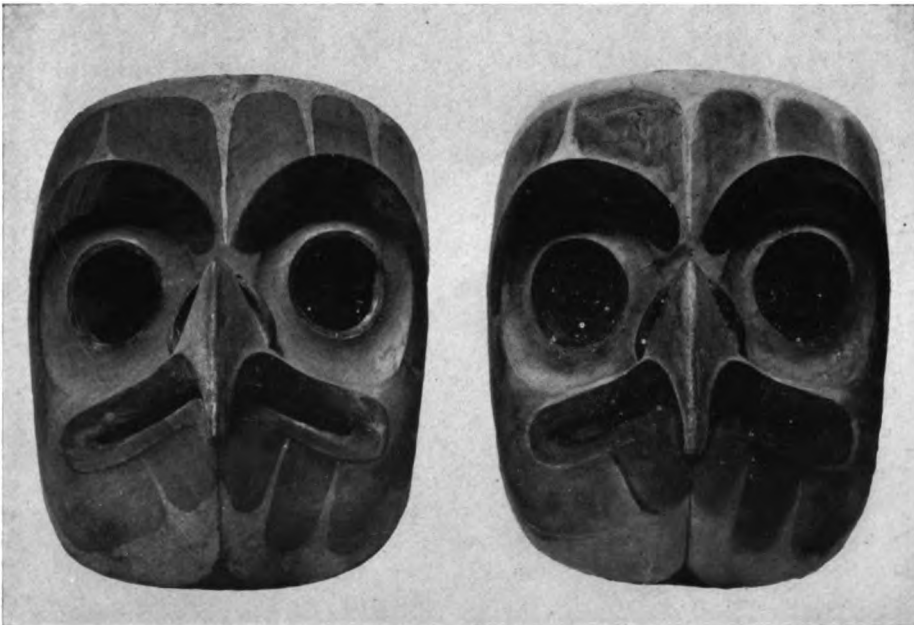
The work as a whole brings an unusually large number of technical problems, for here must be reproduced some forty figures for exhibition without the protection of glass cases in the center of the North Pacific Coast Hall. The lack of protection means that not even the garments, the furs, the masks and regalia can be used, for a few years of such exposure would mean great deterioration in value of some of the richest possessions of the Museum. Therefore everything from the smallest ivory ornament to the largest ceremonial robe has to be reproduced and that in durable materials. The work presents unusual difficulties also, because in addition to its artistic scope, it has to be given great scientific value as a record of individual types of these Indian tribes, requiring at every step work most accurate of form and lifelike in coloring.

In the figure work a new method has been developed to a most successful working so that perfect life casts can be made. A paraffin spraying machine, the idea of which was obtained by Director Bumpus in Europe, has been utilized to cover the model with a coat of wax preliminary to the application of the plaster. Some time after the work was begun, however, a simple brush method of applying the paraffin was substituted for the machine. This yields equally good results and has the advantage of making the method possible for a man working alone in the studio or in the field. The method makes the process less disagreeable for the model than is the case in making the ordinary plaster mold. It is also possible to make larger casts in this manner than by the usual method, such as the full head and shoulders as in a portrait bust, even half the body or in fact the whole if the pose permits. One principal gain in plaster casts taken from molds in which the paraffin process is used is the advantage of accuracy of form whereas in the old method the weight of the plaster compresses and distorts all the softer parts of the body. The threads used to cut the mold being first laid over the model in the usual way, warm paraffin heated in a



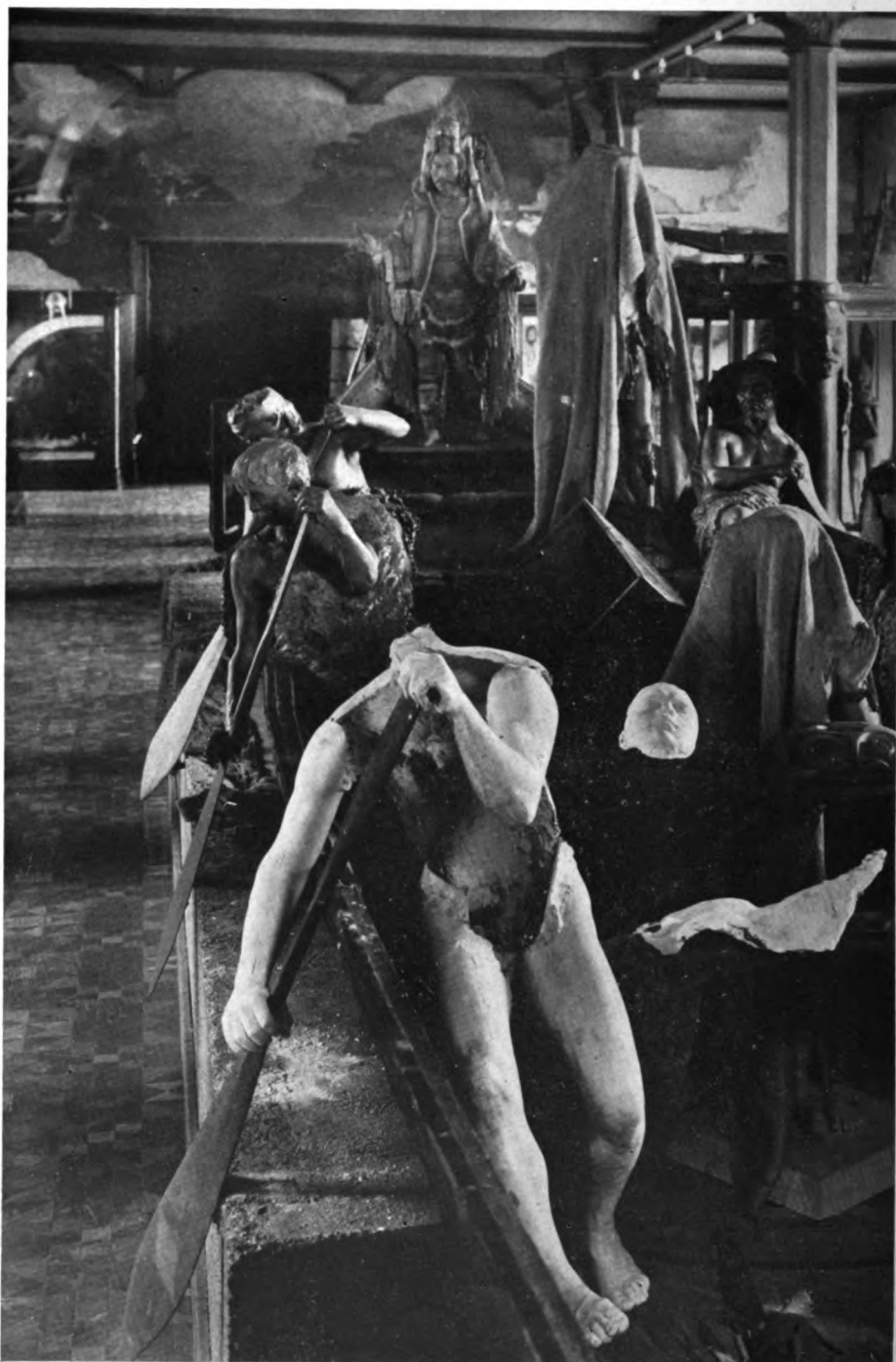
SHAMAN'S RATTLE

One is the original, the other a reproduction in plaster. The half-tone shows only in part the striking similarity of the two because of lack of color



SHAMAN'S CEREMONIAL MASK

Lack of color and unequal lighting prevent the apparent identity that exists when the masks are taken in the hand. That on the right is the original



UNFINISHED FIGURE IN PLACE IN CANOE

Each figure is begun in the studio and put into the canoe incomplete to get perfect adjustment of pose and action in the particular spot to be occupied



THE FINISHED FIGURE



A LATER STAGE IN THE WORK



THE CEREMONIAL BEAR DANCER

double boiler is painted over the model with a soft brush. The work is started at the lowest parts; each stroke of the brush leaves a film which immediately becomes hard; the painting or splashing of the paraffin is continued until about one-fourth of an inch is covered over the model. A coat of this thickness will resist any pressure from the plaster which at this stage is applied over the paraffin and in such thickness as to insure the safe handling of the mold. Before the plaster becomes entirely hard the threads are drawn to cut the mold into manageable parts as in the ordinary "piece mold."

In the matter of dressing the figures it was soon found that plaster alone was too brittle and that for clothing or objects of regalia each specimen must have a different treatment. Woven cloth and skins are copied in burlap or caracas cloth which, dipped in a warm solution of glue water, is hung upon the plaster figure and allowed to stiffen there after adjustment in a natural arrangement of folds corresponding to pose and action. This garment can then be covered with a mixture of plaster and glue, and almost any texture imitated by applying the sticky composition with a modeling tool or

brush. The substance adheres to the fibres of the cloth, becomes tough and quite hard, suitable to take a coat of varnish and the color, and is remarkably well fitted for the work as it can be kept in plastic condition for three or four days. As to the color work on both garments and figures, it has proved better to put on a priming color in a higher key than nature after which a thin wash of shellac over the thoroughly dried color forms a backing for a stippling of transparent colors to accentuate the desired effect, eliminating opaque colors in this finishing work. Finally the oily finish of the new paint may be removed and a lifelike texture given to the surface by rubbing over lightly with pumice stone and turpentine.

Results essential to the representation of life as well as the work of suiting the subject, pose and dress to artistic uses must always remain to the skill of the artist working. The method is valuable in museum work and presents a possibility for a new level of accomplishment.

CANOES OF THE NORTH PACIFIC COAST INDIANS

By Harlan I. Smith

Photographs by the Author

A LONG the Pacific Coast from Puget Sound in Washington past British Columbia to Mt. McKinley in Alaska live seven great groups of sea-faring Indians and canoes make one of their most valuable possessions. Their canoes for use on the ocean differ from those for river navigation and those of the south differ from those of the north. Certain tribes have a characteristic type, but the Indians travel great distances and have traded their canoes from tribe to tribe, so that a given type may be used throughout the entire region.

The Haida of the islands of northern British Columbia and southern Alaska make an ocean-going canoe with a breakwater at the prow and both ends curving upward. Canoes of this type are sometimes only large enough for two or three people, while others, especially those formerly made for warfare, will hold as many as forty. In 1909 two of these canoes more than sixty feet long and with prows and sterns extending higher than a tall man's head were seen on the beach of the Kwakiutl village at Alert Bay. This Haida type is one of the most important and seaworthy of all canoes of the coast. The Tlingit Indians, who occupy the coast of Alaska from the Haida country to that of the Eskimo, own many Haida canoes although they make several kinds of their own.



A Grave Monument probably signifying that the deceased "potlatched" many canoe loads of property

The Chinook is another seaworthy and extensively used type. The Nootka of Cape Flattery and western Vancouver Island use it for whale hunting and launch it skillfully through the tremendous breakers constantly washing their coastline. They use a racing canoe also, somewhat similar in shape but long and narrow.

A river type rather smaller than the Chinook sea-going canoe is used by the Salish of Puget Sound and vicinity and also by the southern tribes of the Kwakiutl of northern Vancouver Island and the adjacent mainland. The prow which extends horizontally over the water has a deep notch in the end and meets the main part of the prow to form almost a right angle. A river canoe with spoon-shaped ends is found among the Bella Coola of the inlets of the northern Kwakiutl country, who are very skillful in navigating the swift rivers fed by melting glaciers. Such a canoe is usually poled, one man standing in the prow, another in the stern and poling on opposite sides. This type of river canoe is also used by the adjacent Kwakiutl tribes. The Salish Indians of the west coast of Washington have a canoe very much like it for river navigation but the prow and stern are like those of a scow.

Decoration of the canoes with carved and painted animal figures characteristic of this general region is common, especially among those of the Haida and Chinook types, and the canoes are always cared for as valuable property. Paths are cleared in the rocks on the beach so that the canoes may be drawn up without injury, and sometimes skidways are formed of cross poles weighted at the ends with stones. A canoe party was observed to improvise such a skidway when landing at a strange beach. The men jumped

into the shallow water and carried their women ashore, then returned to the canoe, flung the dogs into the sea to swim ashore by themselves and next carried arm loads of small slabs to the women. These slabs the women placed crosswise on the beach and as the men pushed the canoe on to the improvised skidway, the women gathered up the slabs as fast as the canoe passed over them and ran ahead to repeat the operation.

Curiously enough a canoe sometimes has a width greater than the diameter of the cedar tree from which it was dug out. To effect this result, the dug out canoe is filled with water, then hot stones are added, and after the wood is somewhat softened, the sides of the canoe are

pressed outward and fastened in place by means of thwarts which are tied in with spruce or cedar rootlets. When the canoe is nearly finished great care is taken in adzing it down, measures being used to get it to the proper thickness throughout. The surface of the canoe is usually charred, which not only serves to give it a good black color but tends to prevent it from decaying.

There is some doubt as to whether sails were used on any of the canoes before the Indians first saw white navigators, but it is certain that they were used before canvas was a commodity in the country, strips of cedar bark being woven together for the purpose as in some of the mats of to-day.



Chinook canoe. Note overhanging prow and vertical stern. Seaworthy and outside of the Haida the most extensively used



River canoes owned by Kwakiutl. Semi-circular in cross section, spoon-shaped at the ends. Poled by two men, one in the prow, one in the stern

THE NEW PLESIOSAUR

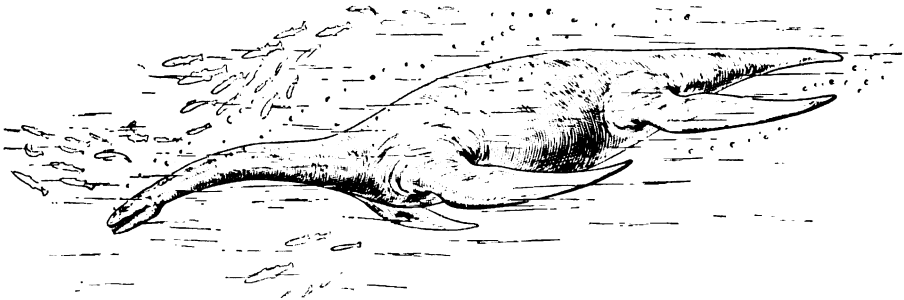
A GREAT MARINE REPTILE OF THE ANCIENT WORLD. IN APPEARANCE COMPARABLE TO "A SNAKE THREADED THROUGH THE BODY OF A TURTLE." THE FOSSIL SKELETON IS NOW ON EXHIBITION ON THE FOURTH FLOOR OF THE MUSEUM

By W. D. Matthew

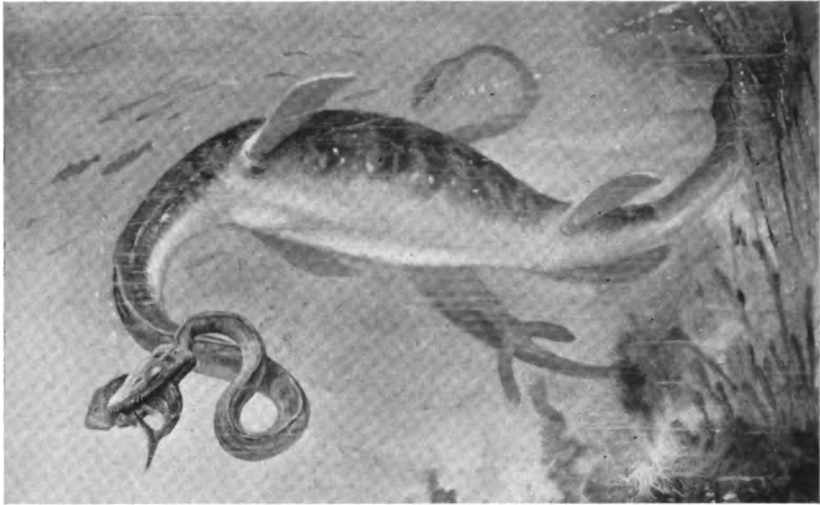
THE latest addition to the fossil skeletons on exhibition is a great marine reptile, eleven feet long, six feet and seven inches across from tip to tip of the paddles. It belongs to a group long since extinct and is very obviously unlike any living animal. The long flippers, broad compact body and short tail suggest a huge sea turtle; but there the resemblance ends, for the creature had no bony carapace or "shell" and the long stiff neck and small flattened head with sharp teeth flaring out from the jaws are very unlike those of any turtles.

This skeleton was found in an unusually complete condition and moreover, the bones were not distorted by crushing, which made it possible to articulate the skeleton in its true proportions and form, and mount it in a characteristic pose. Generally speaking skeletons as ancient as this one are found flattened in the rock, so that while they make a good bas-relief when the rock is chiseled away, they do not show the real form of the animal as when alive.

Plesiosaurs were both numerous and varied in the Age of Reptiles, and their remains have been found in marine formations of this era in all parts of the world. In the United States they occur in many localities from California to New Jersey, but the best specimens are from the Cretaceous formations of the Great Plains. The remains have been mostly fragmentary,



Sketch Restoration of the *Cryptoclidus*, by Edwin Christman. Note the small head, stiff neck and the turtle-like paddles. Based on the mounted skeleton in the American Museum

AMERICAN PLESIOSAUR *Elasmosaurus*

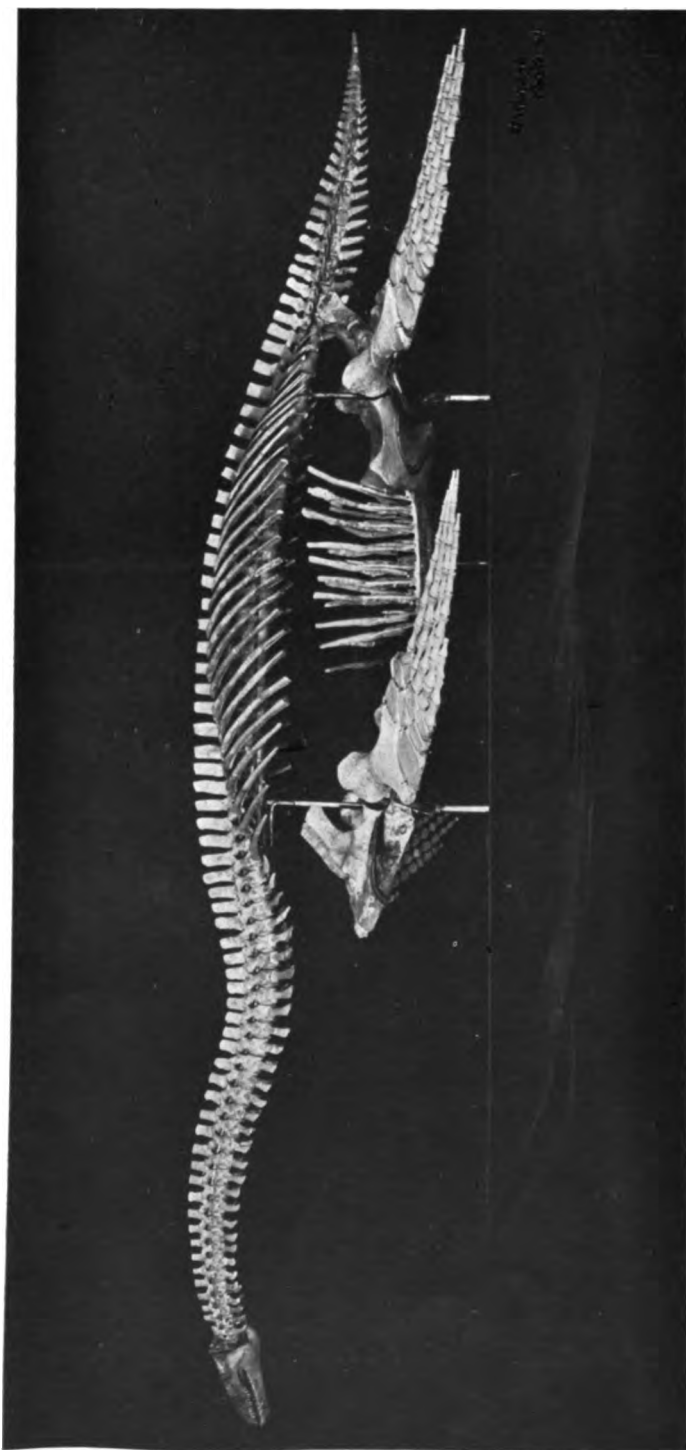
Restoration by Mr. Charles R. Knight. The long neck which was very likely much less flexible than here depicted, probably allowed this reptile to come up stealthily on prey from underneath while swimming near the bottom in shallow seas

though a few more or less complete skeletons are preserved in this and other museums in America.

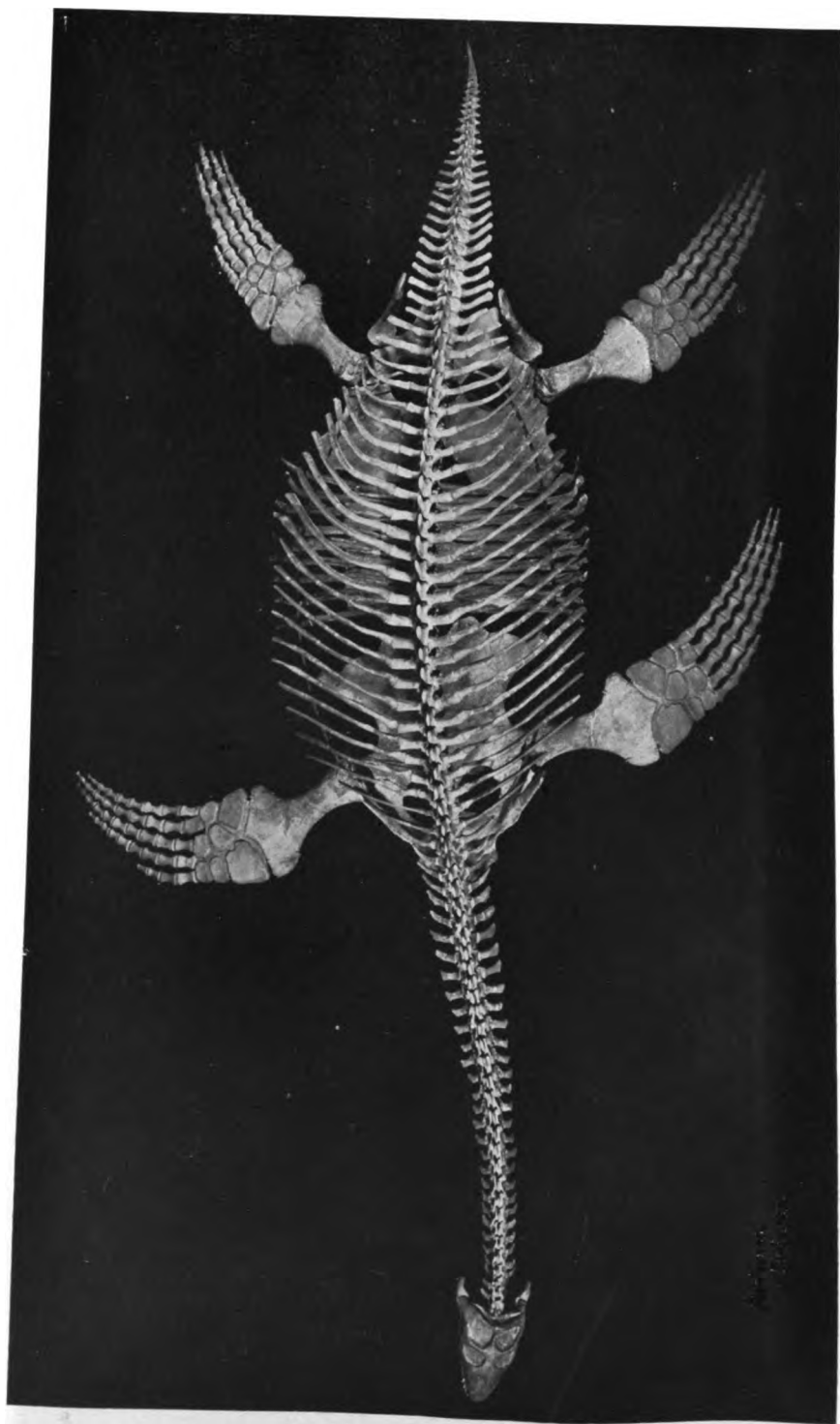
Many skeletons, crushed and flattened but splendidly preserved, have been obtained from the cliffs of Lyme Regis and Whitby in England and from the great slate quarries of Holzmaden in Württemberg, and are preserved in various museums in Europe and America. The clay pits near Peterborough, England, have yielded a large series of Plesiosaur skeletons, most of which are in the British Museum. Fragmentary remains have also been described from India, South America, Australia and New Zealand.

Some of the Plesiosaurs were of gigantic size, thirty to forty feet in length, but more commonly they were smaller, from six to fifteen feet. The length of neck and relative size of the head varied widely in different genera. The American *Elasmosaurus* was forty feet long with a small head and a neck twenty-two feet in length. The other extreme was *Pliosaurus*, equally huge in bulk but with the skull nearly five feet long and the neck only a foot and a half. The smaller Plesiosaurs were intermediate between these two extremes, but most of them had small heads.

The restoration of *Elasmosaurus*, made by Mr. Charles R. Knight under the direction of the late Professor Cope, is based upon a nearly complete skeleton in the Cope collection now in the American Museum. Studies by



Cryptocleidus oroniensis of the Jurassic Period from the Oxford Clays near Peterborough, England. The mounting is by Mr. Charles Lang, under the scientific guidance of Mr. Barnum Brown, Assistant Curator, the pose being selected from careful studies of the skeleton and also of the movements of living sea turtles at the New York Aquarium



The skeleton was obtained in exchange from the British Museum. The skull, parts of the paddles, a number of the vertebrae and many other minor parts have been restored in plaster, modelled when necessary after specimens in the British Museum collections

Professor Dames of Berlin show, however, that the neck was by no means as flexible as indicated by this restoration. This is proved by the character of the joints of the neck vertebrae, which are nearly flat instead of being ball-and-socket joints as in the neck of mammals and of most modern reptiles, or saddle-shaped joints as in birds. These flat joints, like those in the back of mammals, allow but a limited amount of motion at each joint, which must have been only partially offset by the great number of vertebrae in the neck of the Plesiosaurs.

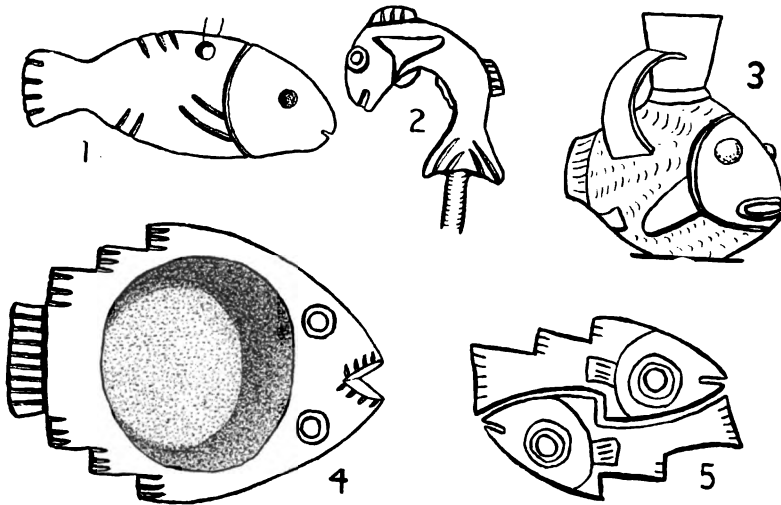
The name Plesio-saur or "near-lizard," given to these animals about a century ago, indicates that they are more like the modern reptiles than are the "fish-lizards" or Ichthyosaurs found in the same geologic formations. But they are not related to lizards any more than to snakes, crocodiles or turtles, and the name of "Great Sea Lizards" which was given to them in the popular natural history works of fifty years ago is an unfortunate one, because there was in the Reptilian Era a third group of great marine reptiles, the Mosasaurs, which were in fact relatives of the lizards and resembled them in many respects, although like Plesiosaurs and Ichthyosaurs, they were provided with swimming paddles instead of feet. Skeletons and restorations of Mosasaurs and Ichthyosaurs are exhibited on the walls of the east corridor near the elevator, and show the differences between these three types of great marine reptiles.

We must suppose that Plesiosaurs were carnivorous, the sharp-pointed flaring teeth being adapted to seize a quick-moving prey rather than to feed upon slow-moving shellfish or upon seaweeds. But from the proportions of the body and the analogy with turtles we may suppose that they swam slowly and usually near the bottom, coming up on their prey stealthily from underneath instead of pursuing it through the water like the swift Ichthyosaurs or the modern sharks and dolphins which these reptiles resembled. The long neck was too stiff for very quick movements, but would nevertheless be of great assistance both in capturing prey and in reaching the surface to breathe, a necessity for all reptiles. It is common to find with Plesiosaur skeletons a considerable number of pebbles enclosed within the body cavity. Sometimes a peck of these pebbles are found — hard, round, with polished surfaces, and varying in size from a hen's egg to a baseball. It is probable that these pebbles assisted digestion, as is the case in many birds, the pebbles seeming to crush and grind the hard parts of the food in the gizzard. If so we must suppose that the prey of the Plesiosaurs contained hard parts for which this kind of crushing was necessary. It has been suggested that they preyed in part upon the squid-like baculites and belemnites whose remains are exceedingly abundant in the same formations.

THE FISH DESIGN ON PERUVIAN MUMMY CLOTHS

AN EXPLANATION OF CERTAIN COMPLEX PATTERNS

OUR largest sources of knowledge of prehistoric Peruvian peoples are records from their graves, not written documents however, for these people of Peru had no written language, but records far more difficult to read with correctness, namely, vessels of clay, wood and brass, or fabrics wrapped about their mummies. In the coastal region of Peru, the people worshipped the sea and the fish as a symbol of the sea, differing in this respect, of course, from inland races. In this coastal region there-

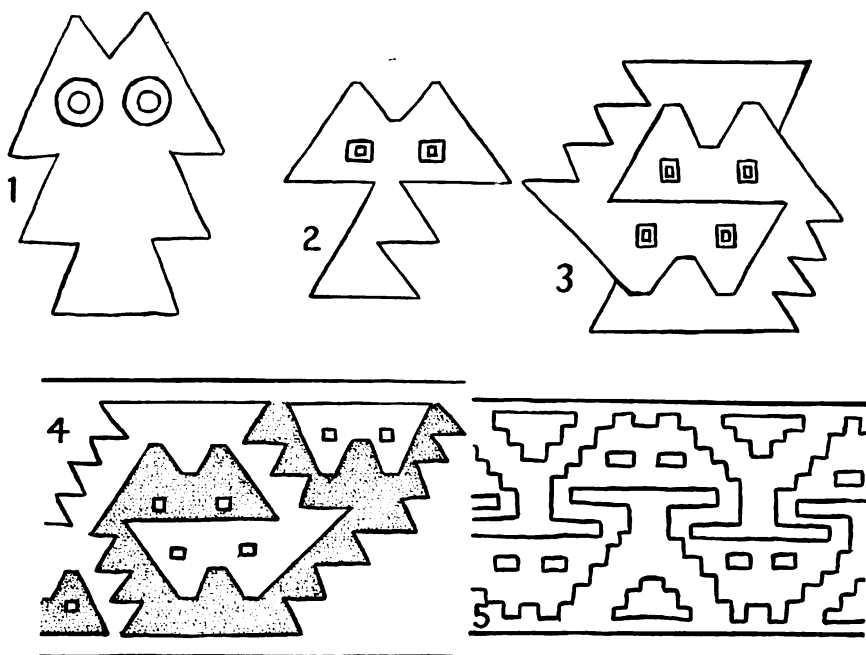


REALISTIC FISH DESIGNS FROM PREHISTORIC PERU

1 — Pendant cut from shell. 2 — Head of bronze implement. 3 — Clay vessel.
4 — Vessel of wood. 5 — Interlocked fish design from pottery

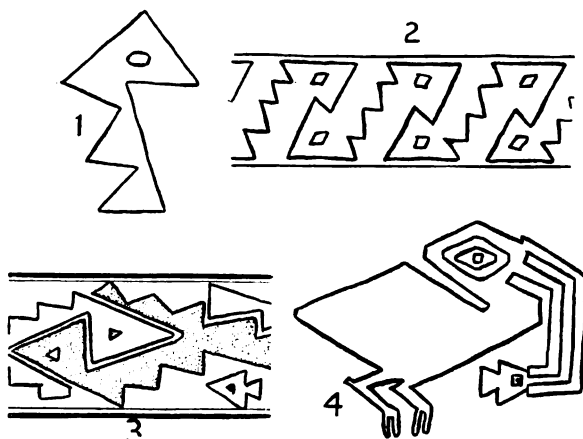
fore, as would be expected, the fish proves a favorite design in decorative art. Pottery, vessels of wood and metal, as well as large coarse pieces of cloth used to wrap about mummy bundles show fish forms with considerable fidelity to nature. Woven fabrics, on the other hand, are decorated more often with conventional designs, designs of much greater simplicity of outline, owing possibly in part to the difficulties in the way of technique in weaving.

Mr. Charles W. Mead of the Depart. of Anthropology has set forth in the Anniversary Volume of Essays presented to Professor Frederic Ward Putnam



CONVENTIONALIZED FISH DESIGNS ON PERUVIAN MUMMY CLOTHS

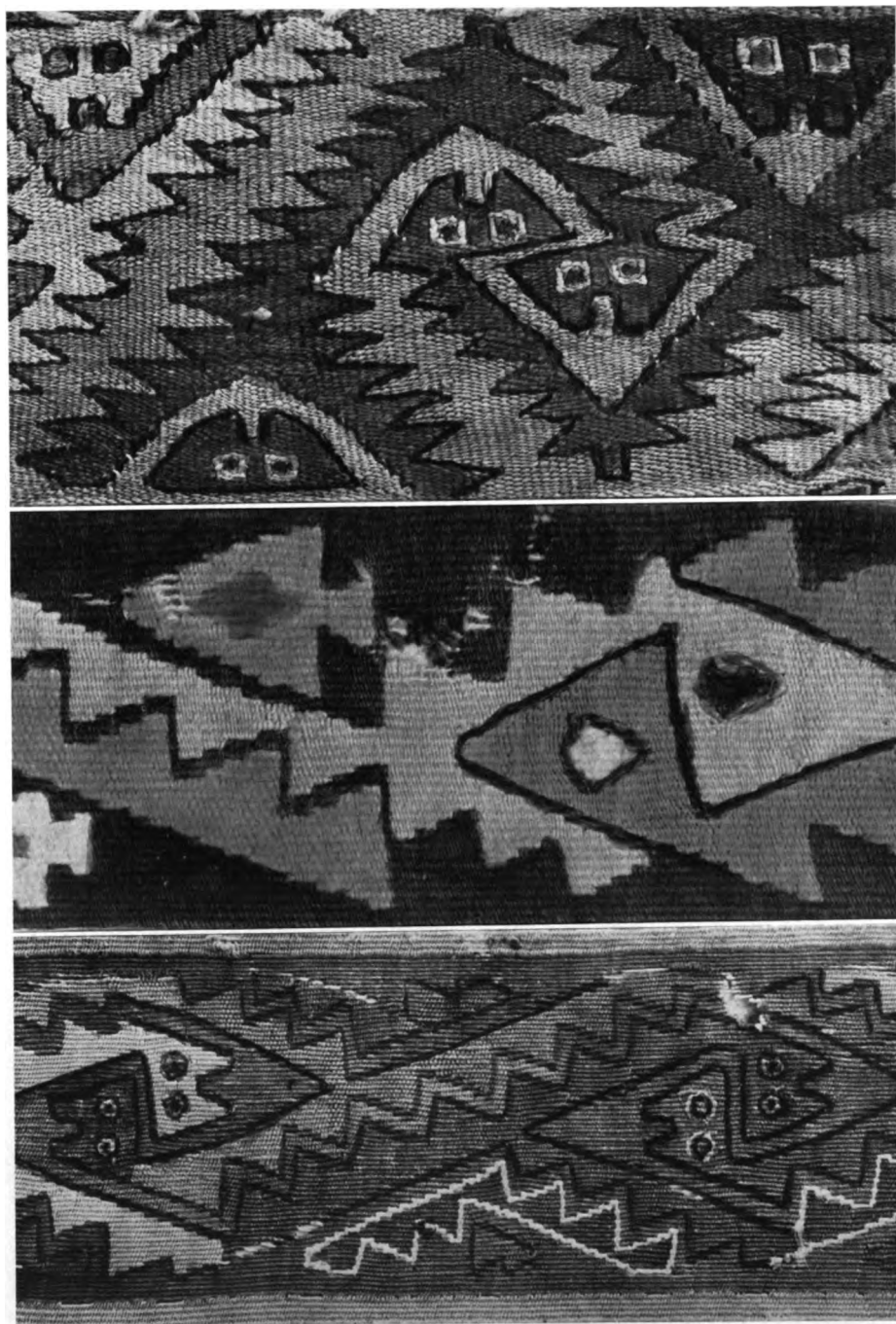
1 — Only the eyes and general form of the fish are preserved. Compare with (4), p. 251. 2 — Still more conventionalized, a key to many complex patterns as in (3), (4) and (5). Compare with (5), p. 251



OTHER CONVENTIONALIZED FISH DESIGNS

The first can be accepted after comparison with (2) above and with (5), p. 251. As a result the second and third also are revealed as fish designs. The fourth represents a pelican-like bird with a fish in its beak; compare with (3)

a very interesting explanation of certain of these complex designs on mummy cloths. He begins with examples in which the fish form is not to be doubted, and traces the design through others less simple to the most complex conventionalized patterns which in no way suggest the fish form, thus showing conclusively that many designs



PORTIONS OF PERUVIAN MUMMY CLOTHS

Chosen to show various highly conventionalized patterns of the interlocked fish design. The softened coloring of these fabrics is wonderfully beautiful

hitherto described as animal figures or designs derived from animal figures are in fact conventionalized fish forms.

The theory underlying the explanation is really that of art progression by degeneration, first promulgated in 1879 by Professor Putnam, who said:

"In the course of time, as art attained increased power of expression, it progressed beyond mere realism and led to the representation of an object by certain conventional characters without that close adherence to nature which was at first necessary to a clear understanding of the idea intended to be conveyed. Thus conventionalism began. Side by side with this conventional representation of objects are found realistic forms; conservatism which is such a strong characteristic of primitive peoples leading to both methods of expression at the same time."

Mr. Mead is the first to make the application of the theory to the evolution of mummy cloth designs; and he makes his point very clear. He has had unusual opportunity for study in the Museum. He has held under his charge for many years the Peruvian mummy cloths, which, if we except those of Berlin, form the world's largest collection. The collection is not wholly known, in fact, because many mummy bundles have never been opened, but still hold secret their fabrics of softened color and symbolic design.

AN INDIAN WHO HELPED THE MUSEUM

By Clark Wissler

NOT so very long ago there came to us the simple message that one of our Indian friends had set out from his tipi expecting to take a brief journey and had taken the long one that ended in the Beyond, the Sand Hills of his people. But a few days before there had arrived at the Museum marked as a gift to the writer a package containing a few specimens and carefully wrapped to themselves a few ordinary trinkets. The contrast between this token and those usually received, for there had been many, might have warned us had not our senses been deadened to the signs of his people. So his last message remains unanswered. It seems fitting, however, that some formal acknowledgment of his services to this Museum should be made. It was chiefly through him that the important medicine bundles in the Plains Indian collections were received, objects no white man should handle, much less own, and certainly not expose to public view. This collection, then, in so far as it represents the Blackfoot Indians is a memorial to him.

He was a priest, a medicine man of the old type, almost the last his race holds. He was born some eighty years ago into the Piegan division

of his people. At the proper age he put himself under the care of a famous medicine man and finally inherited the rituals and formula long used by his teacher. His face was rather feminine and commonplace, except the eyes. No one seeing him in a ceremony when the "spirit was with him" would ever forget the eyes that seemed to light up his whole face. Sharp, the well-known painter, has caught them fast on his canvas. His names, as with the Indian, changed at various periods of life. To us he wished to be known as "The Bear-One."

We first saw The-Bear-One in one of his ceremonies. He wore a robe having blue emblems upon a yellow ground, a simple head-dress of running fisher skins and carried a small feather wand. Through the open front of the robe his body appeared painted an even yellow with star and moon signs on the breast. This robe and its accessories may be seen in the Plains Hall. Not long after, we called upon him. The interview was uneventful and confined to a discussion of our purpose to record faithfully certain facts of Indian life and to preserve certain objects pertaining thereto. While he was respectfully attentive, he seemed not particularly interested. On leaving we remarked that his robe would be a fitting object for our collection. He made no reply, but a burst of laughter from his woman indicated the absurdity of the request. We went our way and the man and his robe were forgotten for a time. One day we received an unexpected call from him, the woman trudging at his heels. He stated that we had asked the robe of him, that such was quite unusual, but that our purpose was creditable; that we were sincere in our efforts to learn the ways of his people, that the memory of them be not lost. Hence, we could have the robe under certain conditions. If he gave the robe to an Indian, he would lose the right to its ceremonial use and the protection of the powers of nature associated therewith; but that he would part with it to us at the cost of making another if we would follow out certain instructions as to its care at our hands and would agree to leave behind the full right to the ceremony. The restrictions as to the care of the robe were necessarily discussed fully, we feeling that no agreement should be made that could not be kept. At one stage of this he became indignant and rose to his feet with the remark, "You came to me with a request, I have come to you with that which you requested and now you receive me as a mere bargainer." A frank apology on our part saved the day and at last common ground was found. At a sign the woman took from under her shawl the old buffalo-hide case containing the robe and placed it in my hands. The-Bear-One urged me to open it and see that all was correct. It was. Without further comment the pair went their way.

We went about our work and waited. The important things were yet to be done. Unless we could get the ritual of that robe, the significance of

its use and its many symbols, we should fail to do what our profession considers most important. By and by we were invited to call on The-Bear-One. This time we got the head-dress and wand upon similar terms. Then followed much visiting between us, but nothing seemed to open the way to the information we desired. He always got away from any discussion that pointed that way. However, he gave us much important data about the ordinary affairs of life. One day he turned to us with, "Let us make an agreement: you always do as I say, I always do as you say." It is useless to try to describe the reaction to this remark. We stood facing each other with long unflinching gaze, each searching the other to the depths. On our part prudence, caution, reason all shouted, "No, never!" Yet — so far we had failed to get a single important medicine bundle, nothing except these few things of his, information concerning them not at all; such a compact would get them all; but the price! At last we ventured, "To such requests as are reasonable to the minds of the asked." Something like reproach and pain flashed across his face, but he clasped my hand and departed. On reflection the rashness of even this impressed us and we resolved not to call upon him for aid except in last resort. In late years he often spoke among his people of this compact as a bond that had never been broken. During the years he made three formal requests of us and we on our part two. One we turned down as impracticable, but made a fair return of another sort.

In association with his robe and head-dress the visitor will see other objects, such as a drum, a whistle of human bone, and the skin of an albino magpie, in short his complete outfit as a medicine man. The information we secured in time: the dreams and visions he experienced, his fasting, how he learned his powers. This we cannot enter upon here. Suffice it to say that the spirit of the sun, the moon, the various stars, the earth, the water and much that pertains to each have some place in the formula of which the objects were, even to him, but crude symbols. He once charged me that if these objects should be rudely handled there would follow an annoying storm of rain and wind. Strangely enough, our workmen in the Museum have twice shifted these objects and in each case the city was swept by a severe storm within two days. Each time we notified our friend of the coincidence; happenings of which he frequently spoke with a pleasure that comes from a faith confirmed.

He believed that he had the knowledge to control the weather and other of nature's works. For many years he had been the leading one to keep the days fair during the annual sun dance ceremonies. One season a young medicine man talked about among his people that he would show his power at the sun dance and bring the rain in spite of our friend. When the day came the horizon was banked with clouds and mist hung upon the hillsides.

The young aspirant appeared in the open among the tipis with a small pipe, dancing, shouting and holding the pipe toward the heavy clouds. Our friend was not idle, but after his way sat modestly in his tipi with his drum — the one in the case — tapping it softly and mumbling his songs and formula. All day long the clouds lowered and rose, of mist there was much, but of rain scarcely a drop. It was an unusual day. Even the prudent old weather prophet would have advised umbrellas and mackintoshes. At intervals the young braggart danced in public, our friend kept to his tipi. After two days of this uncertain weather, the sun came forth bold and clear. Then our friend laid his drum aside and the braggart sought solace in heavy wagers at the wheel games.

At another time our friend accepted a challenge as to which could make it rain more heavily. His rival worked his formula and there was a pour. Then our friend took up his drum and began. Soon there were torrents. The waters rose in all the tipis save his own, but he continued tapping his drum heedless of his fleeing neighbors. What matter if his tipi had been set on a small knoll, thanks to his keen-eyed woman?

The little drum in the case could doubtless tell us many other tales, but they are lost forever. Remember that our friend was but an old unwashed, blanket-covered Indian addicted to the prejudice and folly of his kind, and not the ideal these lines may entice you to imagine. Once he was heard to say that he had lived to know deeply two white men, one daubed in color, one otherwise; that he himself dabbled in medicine, but that each after his way attained his ends. Yes, each has his method — art, science, the medicine formula of the Indian.

There are other objects in the hall that stand as silent memorials to this crude Indian and his time, each object bearing its own unwritten lore and none the less important in science if occasionally the cause of sentiment.

ETHNOLOGICAL COLLECTION FROM CHILI

THE Museum has recently received from Dr. F. D. Aller of Gatico, Chili, a valuable ethnological collection of one hundred and fifty specimens, some of which belong to prehistoric times, others to the sixteenth century. These specimens are much like those in the Museum's collection from Arica, Antofagasta and Chuquicamata, Chili. Of unusual interest are the objects taken from a woman's grave, in particular a work basket of the same form as those found all over the Peruvian coast. In the basket are feather plumes, bone charms and bone awls for basket work, spindles wound with thread, spindle whorls and a finely netted bag used probably for carrying coca.

C. W. M. A. 1

TEACHERS' DAY

QUOTATION FROM THE TALK OF GEORGE H. SHERWOOD, CURATOR OF THE DEPARTMENT OF EDUCATION

The Teachers' Day exercises were attended and appreciated in a way gratifying to the Museum, which on its part made every effort to set forth in detail both the institution's desire and its wealth of equipment for coöperation with the City in educational work along lines of natural science.—Editor.

ONE of the purposes of the Founders of this Museum was to establish an institution which would encourage and develop a study of natural science. I believe that they had in mind an intimate relation between the Museum and the public schools, and our Trustees have faithfully carried out this idea of the Founders. The work of the Department of Education in this connection falls under two heads: first, what we are prepared to do for the teachers in the building, and second, what we are prepared to do in the schools.

Considering first the work in the building.—We give every fall and spring to school children a series of lectures prepared with the idea of supplementing the work in your class rooms. Topics are chosen for the most part by the teachers and are fully illustrated. Most of you, I know, are sending your pupils to these. In addition to this, largely through the generosity of Dr. A. S. Bickmore, who was founder and first curator of our Department of Education, we have a large series of lantern slides, between thirty and forty thousand. Any teacher may come to our building, select slides, make an appointment, bring her class to the building and there give a lecture on the subject she has chosen. The Museum furnishes lecture room, slides and operator and if the teacher does not care to do the talking will provide also a person to do the talking.

We have started in a small way a room for the children. In this room are modelling tools and drawing instruments and animals of interest to the children. The purpose is recreative, but a competent instructor is always there to direct the play and recreation. And more recently we have opened a room for the blind. In that room are objects which can be handled and which, through the coöperation of the Library for the Blind, have been labelled in raised type.

Second, the work done in the schools.—I refer to the circulating collections sent out to the public schools. When the Department of Education of New York City placed in your hands its first syllabus of nature study, it made no provision to supply you with material. As a result we had numer-

ous applications for assistance. Director Bumpus felt that here was an opportunity to carry out the idea of the Founders and prepared ten small cases of birds. These were sent to the schools. From that beginning has grown the work of to-day, but instead of ten cases there are more than four hundred cases and we are supplying monthly nearly four hundred schools of the city. You are better able than I to judge of the practical use of these collections. We have felt encouraged by a letter that came from a little girl in one of the East side schools. The teacher had evidently used a collection of our birds for a lesson in language which had taken the form of a letter to the Director of the Museum: "My dear Director Bumpus, I am very glad that you sent the birds to us. We have enjoyed them very much. I think they are all beautiful, but of all the birds I have studied the one I like the best is the English sparrow because it is the only one I have ever seen."

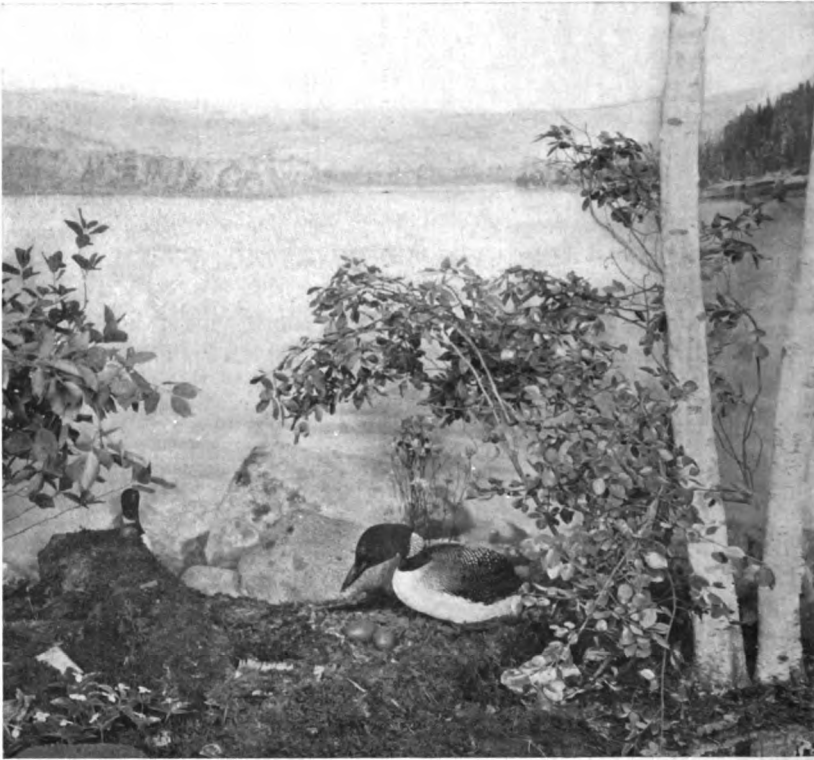
NEWS FROM THE ARCTIC EXPEDITION

SINCE the last issue of the JOURNAL, letters have been received from the Stefánsson-Anderson Expedition. That from Mr. Stefánsson was written April 25 at a place fifty miles on the way to the Coppermine and holds out bright prospects for the journey, in part because he had fortunately been able to purchase fifty pounds of pemmican from a sailor at Cape Parry. The expedition was about to start on the remaining three hundred miles but with only three Eskimo assistants, great difficulty having been experienced in getting any Eskimos to go because of fear of violence from the Coronation Gulf people. Of these three he writes that Natkutjiak is the sort who will go anywhere, Tannaumirk will follow anywhere and Pannigabluk, the woman, is used to starving, having been near death from hunger half a dozen times. The country through which they will pass has many lakes and rivers unknown to geographers. Mr. Stefánsson is supplied with charts of the region made by Dr. Richardson in 1846 and he considers them authoritative, saying, "They omit many things, but do not put down things not here. For the huge non-existent R. la Roncière, Dr. Richardson is not to blame. His charts are innocent of it, though all our newer maps have it."

The letter from Dr. Anderson was written August 13. It announces that at last he has in hand the supplies sent by the Museum in 1908 and 1909. He had not yet heard from Mr. Stefánsson, who, however, had told him not to worry if he did not hear until Christmas.

THE NEW LOON GROUP

THE loon's penetrating call, reported to sound like demoniac laughter, is well known to people visiting northern lakes. Few see the bird, however. If they do catch a brief glimpse of it, they decide that its neat tailor-like appearance, with head black, breast clear white, back closely polka-dotted with white, belies the weirdness of its call. Loons are noted for skill in diving and swimming, being able to proceed rapidly under



A PORTION OF THE NEW HABITAT BIRD GROUP

several fathoms of water. It is said that they have been caught with hooks set for trout eighty feet below the surface in New York lakes. It is known that many loons winter at sea fifty miles or more from land.

Two loons are shown in the new habitat bird group which is reproduced from studies made in June, 1909, on the New Hampshire shore of Lake

Umbagog. One bird is standing erect over its two large eggs in a nest of leaves on the ground; the other just coming up from the water is half hidden by a ridge of moss. That it is June is proclaimed in the foreground of the group by a clump of blossoming viburnum, by tall purple rhodora and on the ground waxen flowers of bunchberry. Rocks at the edge of the lake make gradual the transition to the painted background where the artist, Mr. Hobart Nichols, has portrayed a portion of the lake, its irregular evergreen-covered projections of land and its still reaches of water leading to a farther shore and mountains in the distance.

This group is the last in the series of habitat bird groups installed under the supervision of Mr. Frank M. Chapman, the habitat being the work of Mr. J. D. Figgins and Mr. A. E. Butler. That the loon group has been made possible is due to the generosity of the benefactors to whom the Museum is indebted for the whole series.

WOMEN NOT CONSERVATIONISTS

From an Address by Frank M. Chapman

INSECTS cost a loss to our forests of \$100,000,000 a year. The Biological Survey of the United States has shown that the stomach of a single cedar bird contained 100 canker worms, that of a cuckoo 250 tent caterpillars, of a chickadee 454 plant lice, of a flicker 1,000 chinch bugs, and of a scarlet tanager 630 gypsy moth caterpillars. A tanager eats moth caterpillars at the rate of 2,100 an hour. A Maryland yellow-throat ate 3,500 plant lice in forty minutes.

Yet chief among the enemies of the birds and therefore of the forests is woman. In shopping districts where I have made ornithological studies on women's hats, I found woodpeckers, flycatchers, orioles, bobolinks, meadow larks, tree and white-throated sparrows, snow buntings, waxwings, swallows, tanagers, warblers, thrashers, robins and bluebirds by scores and hundreds. The destructive power of fashion is shown in the case of the ptarmigan grouse. In winter it is snowy white and its plumage may be dyed any color. The flesh of the birds is good food, but the food demand did not drain the supply. When the feathers became fashionable, however, 2,000,000 were killed in four years; one shipment contained ten tons of wings. Twenty thousand paradise birds are shipped annually. Of the thousands of herons which glorified our marshes only a few remain since the egret plumes became the fashion. In one year Venezuela exported 1,538,000 plumes of herons, and these figures do not take into account possibly double that number of young herons which starved in their nests for lack of care.

MUSEUM NEWS NOTES

THE following have been elected recently to membership in the Museum: Life Members, MESSRS. BENJAMIN WALWORTH ARNOLD, DICKSON Q. BROWN, CHARLES W. HARKNESS, D. P. KINGSLEY and T. B. PARKER, CAPTAIN JOHN J. PHELPS and COLONEL ROBERT M. THOMPSON; Sustaining Member, MR. RALPH WURTS-DUNDAS; and Annual Members, HIS EXCELLENCY WILLIAM H. TAFT, MESSRS. WILLIAM A. ADRIANCE, MARSHAL CHANDLER BACON, F. O. BEZNER, L. F. BRAINE, W. B. COGSWELL, FRANK R. CORDLEY, JULIEN T. DAVIES, J. BENJAMIN DIMMICK, F. N. DOUBLEDAY, H. C. DRAYTON, WILLIAM SEYMOUR EDWARDS, THOMAS W. FARNAM, WILLIAM T. FLOYD, J. R. GLADDING, HENRY J. S. HALL, PHILIP W. HENRY, A. F. HOLDEN, L. E. HOLDEN, JOHN H. ISELIN, EDWARD H. KIDDER, OTTO R. KOECHL, TOWNSEND LAWRENCE, ARTHUR LEHMAN, ARTHUR LINCOLN, LUCIUS N. LITTAUER, R. S. LOVETT, ALFRED BISHOP MASON, STEPHEN O. METCALF, ROBERT GRIER MONROE, J. SEAVER PAGE, EDWARD C. PERKINS, GEORGE E. PERKINS, LEWIS A. PLATT, GEORGE E. SCHANCK, ALFRED L. SELIGMAN, GEORGE ST. JOHN SHEFFIELD, LOUIS MORRIS STARR, SAMUEL THORNE, JR., THOMAS G. WASHBURN, ALEXANDER M. WHITE, LUCIUS WILMERDING, ORME WILSON, JR., and JOHN YARD; REV. DR. GEORGE C. YEISLEY, DRS. CHARLES L. DANA and JOHN E. WILSON, GENERAL CHARLES F. ROE and MMES. CHARLES OTIS KIMBALL, JOHN MURRAY MITCHELL, and E. L. BREESE NORRIE.

THE following members of the Board of Trustees contributed toward the expense of Teachers' Day: Messrs. Cleveland H. Dodge, J. Pierpont Morgan, Adrien Iselin, Jr., Seth Low, J. Hampden Robb and Henry F. Osborn.

AT the Quarterly Meeting of the Board of Trustees of the Museum held on November 14 the following changes were made in the scientific staff: Dr. Louis Hussakof was appointed Associate Curator of Fossil Fishes; Mr. John T. Nichols, Assistant Curator of Recent Fishes; and Dr. William K. Gregory, Assistant in the Department of Vertebrate Palæontology.

THREE members of the Scientific Staff, Dr. J. A. Allen, Curator of the Department of Mammalogy, Mr. Frank M. Chapman, Curator and Mr. W. DeW. Miller, Assistant in the Department of Ornithology, attended the 28th annual meeting of the American Ornithologists' Union in Washington, November 15-17. Dr. Allen was the first President of the Union, serving for seven years (1883-1891); Mr. Chapman is now first Vice-President.

MR. BARNUM BROWN of the Department of Vertebrate Palæontology has recently returned from an expedition to Montana which completes the work on the Laramie formation begun in 1902 and carried on continuously since that time except during the year 1907. The most important specimen obtained was an unusually complete skeleton of *Trachodon*. As a result of the work in Montana the Museum will be able to restore and mount all of the chief representatives of dinosaur life during the Laramie Cretaceous period which marked the close of dinosaur life in the United States.

THE NATIONAL ASSOCIATION OF AUDUBON SOCIETIES met at the Museum October 25. Besides other business a resolution was passed expressing to Mrs. Dutcher the gloom cast upon the meeting by the illness of William Dutcher, the Association's President. The lecture in the evening was given by Professor John B. Watson of Johns Hopkins University on the "Facilities for the Study of Animal Behavior on the Dry Tortugas Bird Reservation."

MR. W. DEW. MILLER acted recently as expert ornithologist to pass on the legality of sale of about one hundred species of birds submitted by milliners of the State. Mr. Miller identified the skins and reported that under the ruling of the Shea bill passed by the last Legislature, forty-three among them could not be used on women's hats. Among these were Bohemian waxwing, snow bunting, swift, magpie, sooty and white terns, green heron and white heron, screech owl, condor, jay and skylark.

THE MUSEUM LIBRARY lacks for its files volumes II to VIII inclusive of the JOURNAL. The librarian would be grateful if Members who have any of these numbers and do not care to keep them would send them to the Museum.

LECTURE ANNOUNCEMENTS

MEMBER'S COURSE

The following illustrated lectures of the course remain to be given to Members of the Museum and persons holding complimentary tickets given them by Members.

Thursday evenings at 8:15 o'clock. Doors open at 7:45.

December 1 — MR. FRANK M. CHAPMAN, "From Sea-level to Snow-line in Vera Cruz, Mexico."

December 8 — MR. JAMES L. CLARK, "Snap Shots from British East Africa."

December 15 — DR. PLINY E. GODDARD, "Nomadics of the Southwest."

December 22 — MR. ROY C. ANDREWS. Subject to be announced.

PUPIL'S COURSE

These lectures are open to the pupils of the public schools when accompanied by their teachers and to the children of Members of the Museum on presentation of Membership tickets.

Lectures begin at 4 o'clock.

- December 2 — MRS. AGNES L. ROESLER, "Children of All Nations."
 December 5 — MR. WALTER GRANGER, "Transportation: Past and Present."
 December 7 — DR. LOUIS HUSSAKOF, "A Trip to Europe."
 December 9 — MR. BARNUM BROWN, "Life on the Plains."

PEOPLE'S COURSE

Given in coöperation with the City Department of Education.

Saturday evenings at 8:15 o'clock. Doors open at 7:30.

The last three of a course of five lectures on "Biology" by MR. BENJAMIN C. GRUENBERG. Illustrated by stereopticon views.

- December 3 — "Life Defensive: Resisting the Environment."
 December 10 — "Life Victorious: Mastering the Environment."
 December 17 — "Heredity."

Tuesday evenings at 8:15 o'clock. Doors open at 7:30. Illustrated.

- December 6 — MR. CHARLES T. HILL, "The Post-Roads of the High Alps."
 December 13 — DR. JOHN C. BOWKER, "The Passion Play."

LEGAL HOLIDAY COURSE

Fully illustrated. Open free to the public. Tickets not required.

Lectures begin at 3:15 p. m. Doors open at 2:45 p. m.

- December 26 — DR. LOUIS HUSSAKOF, "The Fish and Fisheries of the Southern States."
 January 2 — MR. ROY W. MINER, "Corals and Coral Islands."
 February 22 — PROF. C-E. A. WINSLOW, "Insect-Carriers of Disease."

Public meetings of the New York Academy of Sciences and its Affiliated Societies will be held at the Museum according to the usual schedule. Programmes of meetings are published in the weekly *Bulletin* of the Academy.

The American Museum Journal

MARY CYNTHIA DICKERSON, *Editor*.

FRANK M. CHAPMAN,
 LOUIS P. GRATACAP,
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The membership fees are,

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Sustaining Members (Annual).....	25	Patrons.....	1000
Life Members.....	100	Benefactors (Gift or bequest)	50,000

All money received from membership fees is used for increasing the collections and for developing the educational work of the Museum.

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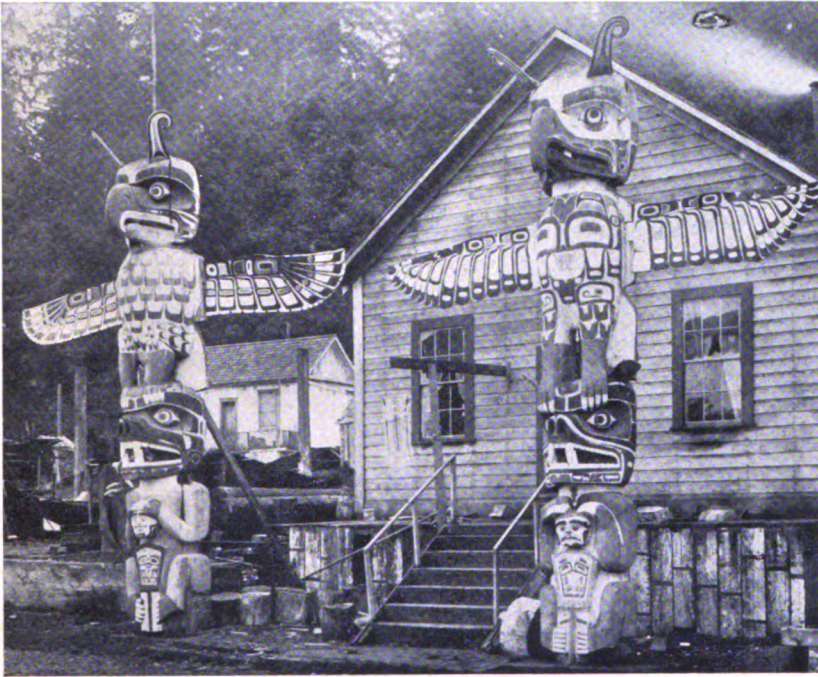
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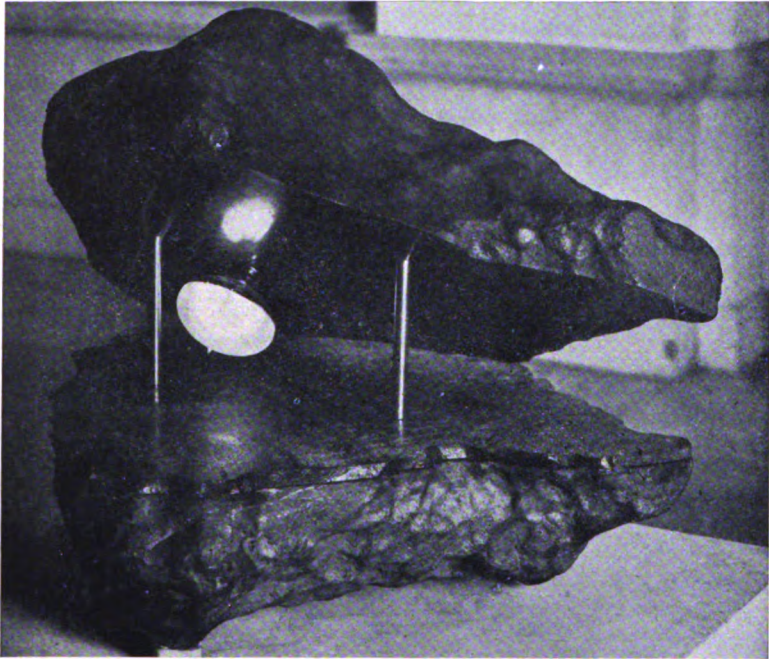
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